

W.H.G. Kingston

"The Western World"

Preface.

In the following pages I have endeavoured to give, in a series of picturesque sketches, a general view of the natural history as well as of the physical appearance of North and South America.

I have first described the features of the country; then its vegetation; and next the wild men and the brute creatures which inhabit it. However, I have not been bound by any strict rule in that respect, as my object has been to produce a work calculated to interest the family circle rather than one of scientific pretensions. I have endeavoured to impart, in an attractive manner, information about its physical geography, mineral riches, vegetable productions, and the appearance and customs of the human beings inhabiting it. But the chief portion of the work is devoted to accounts of the brute creation, from the huge stag and buffalo to the minute humming-bird and persevering termites,—introduced not in a formal way, but as they appear to the naturalist-explorer, to the traveller in search of adventures, or to the sportsman; with descriptions of their mode of life, and of how they are found, hunted, or trapped. I have described in the same way some of the most remarkable trees and plants; and from the accounts I have given I trust that a knowledge may be obtained of the way they are cultivated, and how their produce is prepared and employed. Thus I hope that, with the aid of the numerous illustrations in the work, a correct idea will be gained of the wilder and more romantic portions of the great Western World.

William H.G. Kingston.

Part 1—Chapter I.

North America.

Introductory.—Physical Features of North America.

The continent of America, if the stony records of the Past are read aright, claims to be the oldest instead of the newest portion of the globe. (According to some geologists, Labrador was the first part of our globe's surface to become dry land.) Bowing to this opinion of geologists till they see cause to express a different one, we will, in consequence, commence our survey of the world and its inhabitants with the Western Hemisphere. From the multitude of objects which crowd upon us, we can examine only a few of the most interesting minutely; at others we can merely give a cursory glance; while many we must pass by altogether,—our object being to obtain a general and retainable knowledge of the physical features of the Earth, the vegetation which clothes its surface, the races of men who inhabit it, and the tribes of the brute creation found in its forests and waters, on its plains and mountains.

As we go along, we will stop now and then to pick up scraps of information about its geology, and the architectural antiquities found on it; as the first will assist in giving us an insight into the former conditions of extinct animals, and the latter may teach us something of the past history of the human tribes now wandering as savages in regions once inhabited by civilised men.

Still, the study of Natural History and the geographical range of animals is the primary object we have in view.

Though the best-known portions of the Polar Regions are more nearly connected with North America than with Europe or Asia, we propose to leave them to be fully described in another work. It is impossible, in the present volume, to embrace more than the continental parts of the Western World.

Looking down on the continent of North America, which we will first visit, we observe its triangular shape: the apex, the southern end of Mexico; the base, the Arctic shore; the sides, especially the eastern, deeply indented, first by Hudson Bay, which pierces through more than a third of the continent, then by the Gulf of Saint Lawrence, and further south by Chesapeake Bay and the Bay of Fundy. On the western coast, the Gulf of California runs 800 miles up its side, with the Rio Colorado falling into it; and further north are the Straits of Juan da Fuca, between Vancouver's Island and the mainland, north of which are numerous archipelagoes and inlets extending round the great peninsula of Yukon to Kotzebue Sound.

Parallel with either coast we shall see two great mountain-systems—that called the Appalachian, including the chain of the

Alleghanies, on the east, and the famed Rocky Mountains on the west—running from north to south through the continent.

We shall easily recollect the great water-system of North America if we consider it to be represented by an irregular cross, of which the Mississippi with its affluents forms the stem; Lake Superior and the River Saint Lawrence, including the intermediate lakes, the eastern arm; the Lake of the Woods and its neighbours, Lake Winnipeg and the Saskatchewan, the western arm; and the northern lakes of Athabasca, the Great Slave Lake, and the Mackenzie River, the upper part of the cross. If we observe also a wide level region which runs north and south between the Arctic Ocean and the Gulf of Mexico, bounded on either side by the two lofty mountain ranges already mentioned, we shall have a tolerably correct notion of the chief physical features of the North American continent.

Arriving at the northern end, we shall find it reaching some four degrees north of the Polar Circle, though some of its headlands extend still further into the icy sea. Beyond it stretches away to an unknown distance towards the Pole a dense archipelago of large islands, the narrow channels between them bridged over in winter by massive sheets of ice, affording an easy passage to the reindeer, musk-oxen, and other animals which migrate southward during the colder portion of the Arctic winter.

Northern Region.

With that end of America will ever be associated the names of Sir John Franklin and his gallant companions, who perished in their search of the North-west Passage; as well as those of other more fortunate successors, especially of Captains McClure and Collinson of the British navy, to the first of whom is due the honour of leading an expedition from west to east along that icy shore; while Captain Collinson took his ship, the *Enterprise*, up to Cambridge Bay, Victoria Land, further east than any ship had before reached from the west—namely, 105 degrees west—and succeeded in extricating her from amid the ice and bringing her home in safety. Captain McClure, not so fortunate in one respect, was compelled to leave his ship frozen up. The two expeditions, while proving the existence of a channel, at the same time showed its uselessness as a means of passing from the Atlantic to the Pacific, as, except in most extraordinary seasons, it remains blocked up all the year by ice.

The northern end of the American continent is a region of mountains, lakes, and rivers. Several expeditions have been

undertaken through it,—the first to ascertain the coast-line, by Mackenzie, Franklin, Richardson, Back, and others, and latterly by Dr Rae; and also by Sir John Richardson, who left the comforts of England to convey assistance to his long-missing former companions, though unhappily without avail. These journeys, through vast barren districts, among rugged hills, marshes, lakes, and rivers, in the severest of climates, exhibit in the explorers an amount of courage, endurance, and perseverance never surpassed. In the course of the rivers occur many dangerous falls, rapids, and cataracts, amid rocks and huge boulders, between which the voyagers' frail barks make their way, running a fearful risk every instant of being dashed to pieces. Not a tree rears its head in the wild and savage landscape, the vegetation consisting chiefly of lichens and mosses. Among the former the tripe de roche is the most capable of supporting life. Here winter reigns with stern rigour for ten months in the year; and even in summer biting blasts, hail-storms, and rain frequently occur. Yet in this inhospitable region numerous herds of reindeer, musk-oxen, and other mammalia find subsistence during the brief summer, as do partridge and numerous birds of various species.

Here the Esquimaux lives in his skin-tent during the warmer months, and in his snow-hut in winter, existing on the seals which he catches with his harpoon, the whales occasionally cast on shore, and the bears, deer, and smaller animals he entraps.

The numerous rivers flowing from the mountain-ridges mostly make their way northward. The Mackenzie, the largest and most western, rising in the Great Slave and Great Bear Lakes, falls, after a course of many hundred miles, into the Polar Sea. The Coppermine River, rising in Point Lake, makes its course in the same direction; while eastward, the great Fish or Back River, flowing from the same lake as the first mentioned stream, reaches the ocean many hundred miles away from it, at the lower extremity of Bathurst Islet. It runs rapidly in a tortuous course of 530 geographical miles through an iron-ribbed country, without a single tree on the whole line of its banks, expanding here and there into five large lakes, and broken by thirty-three falls, cascades, and rapids ere it reaches the Polar Sea. Not far from its mouth rises the barren rocky height of Cape Beaufort.

It was down this stream that Captain Back, the Arctic explorer, made his way, but was compelled to return on account of the inclemency of the weather and the difficulty of finding fuel; the only vegetation which he could discover being fern and moss,

which was so wet that it would not burn, while he was almost without fire, or any means of obtaining warmth, his men sinking knee-deep as they proceeded on shore in the soft slush and snow, which benumbed their limbs and dispirited them in the extreme. Through this country the unhappy remnant of the Franklin expedition, many years later, perished in their attempt to reach the Hudson Bay Company's territory. Here, in winter, the thermometer sinks 70 degrees below zero. Even within his hut, when he had succeeded in lighting a fire, Back could not get it higher than 12 degrees below zero. Ink and paint froze. The sextant cases, and boxes of seasoned wood—principally fir—all split; the skin of the hands became dried, cracked, and opened into unsightly and smarting gashes; and on one occasion, after washing his hands and face within three feet of the fire, his hair was actually clotted with ice before he had time to dry it. The hunters described the sensation of handling their guns as similar to that of touching red-hot iron; and so excessive was the pain, that they were obliged to wrap thongs of leather round the triggers to prevent their fingers coming in contact with the steel. Numbers of the Indian inhabitants of the country perish from cold and hunger every year—indeed, it seems wonderful that human beings should attempt to live in such a country; yet much further north, the hardy Esquimaux, subsisting on whale's blubber and seal's flesh, contrives to support life in tolerable comfort.

To the south of the Arctic Circle stunted fir-trees begin to appear, and at length grow so thickly, that it is with difficulty a passage can be made amid them. Frequently the explorer has to clamber over fallen trees, through rivulets, bogs, and swamps, till often the difficulties in the way appear insurmountable to all but the boldest and the most persevering.

Mountains.

On the western side of the continent rises gradually from the Polar regions the mighty chain which runs throughout its whole length—a distance of altogether 10,000 miles. The northern portion, known as the Rocky Mountains, runs for 3000 miles, in two parallel chains, to the plains of Mexico, flanked by two other parallel ranges on the west,—the most northern of which are the Sea Alps of the north-west coast, and on the southern, the mountains of California. At the north-western end of the Sea Alps rises the lofty mountain of Mount Elias, 17,000 feet in height—the highest mountain in North America—not far from Behring Bay; while another range, the Chippewayan, stretches eastward, culminating in Mount Brown, 10,000 feet in height,

and gradually diminishing, till it sinks into insignificance towards the Arctic Circle. Point Barrow is the most northern point of America on the western side. It consists of a long narrow spit, composed of gravel and loose sand, which the pressure of the ice has forced up into numerous masses, having the appearance of rocks. From this point eastward to the mouth of the Mackenzie River the coast declines a little south of east. The various mountain ranges existing on the eastern side of the continent, including the chain of the Alleghanies, form what is called the Appalachian system. It consists of numerous parallel chains, some of which form detached ridges, the whole running from the north-east to the south-west, and it extends about 1200 miles in length—from Maine to Alabama. Besides the Alleghany Mountains in the western part of Virginia and the central parts of Pennsylvania, it embraces the Catskill Mountains in the State of New York, the Green Mountains in the State of Vermont, the highlands eastward of the Hudson River, and the White Mountains in New Hampshire. Mount Washington, which rises to an elevation of 6634 feet out of the last-named range, is the highest peak, of the whole system. To the north of the Saint Lawrence the lofty range of the Wotchish Mountains extends towards the coast of Labrador; while the whole region west and north of that river and the great Canadian lakes is of considerable length, the best-known range being that which contains the Lacloche Mountains, which appear to the north of Lake Huron, and extend towards the Ottawa River. These two great ranges of mountains divide the North American continent into three portions.

Great Rivers.

The rivers which rise on the eastern side of the Appalachian range run into the Atlantic; those which rise west of the Rocky Mountains empty themselves into the Pacific; while the mighty streams which flow between the two, pass through the great basin of the Mississippi, and swell the waters of that mother of rivers. The great valley of the Mississippi, indeed, drains a surface greater than that of any other river on the globe, with the exception perhaps of the Amazon. The Missouri, even before it reaches it, runs a course of 1300 miles, while the Mississippi itself, before its confluence with the Missouri, has already passed over a distance of 1200 miles; thence to its mouth its course is upwards of 1200 miles more. The Arkansas, which flows into it, is 2000 miles long, and the Red River of the south 1500 miles in length; while the Ohio, to its junction with the Mississippi, is nearly 1000 miles long.

North America may be said to contain four great valleys—that of the Mississippi, running north and south; that of the Saint Lawrence, from the south-west to the north-east; that of the Saskatchewan, extending from the Rocky Mountains below Mount Brown to Lake Superior; that of the Mackenzie, from the Great Slave Lake to the Arctic Ocean. Although a large portion of the eastern side of the continent is densely-wooded, there are towards the west, extending from the Gulf of Mexico to the Arctic Ocean, vast plains. In the south they are treeless and barren in the extreme; while advancing northward they are covered with rich grasses, which afford support to vast herds of buffaloes, as well as deer and other animals.

Lakes.

The most remarkable feature in North America is its lake system—the largest and most important in the world. In the north-west, at the foot of the Rocky Mountains, are the Great Bear and Great Slave Lakes, which discharge their waters through the Mackenzie River into the Arctic Ocean. Next we have the Athabasca, Wollaston, and Deer Lakes. In the very centre of the continent are the two important lakes of Winnipeg and Winnipegosis,—the former 240 miles in length by 55 in width, and the latter about half the size. The large river of the Saskatchewan flows into Lake Winnipeg, and with it will, ere long, form an important means of communication between the different parts of that vast district lately opened up for colonisation. At its southern end the Red River of the north flows into it, on the banks of which a British settlement has long been established. Several streams, however, make their way into Hudson Bay. Between it and Lake Superior is an elevated ridge of about 1500 feet in height; the streams on the west falling into Lake Winnipeg, while those which flow towards the east reach Lake Superior.

We now come to the site of the five largest fresh-water lakes in the world. Lake Superior extends, from west to east, 335 miles, with an extreme breadth of 175. Its waters flow through the Saint Mary's River by a rapid descent into Lake Huron, which is 240 miles long. This lake is divided by the Manitoulin islands into two portions, and is connected with Lake Michigan by a narrow channel without rapids, so that the two lakes together may be considered to form one sheet of water. On its southern extremity the waters of Lake Huron flow through another narrow channel, which expands during part of its course into Lake Saint Clair; and they then enter Lake Erie, which has a length of 265 miles, and a breadth of 80 miles. It is of much

less depth than the other lakes, and its surface is therefore easily broken up into dangerous billows by strong winds. Passing onward towards the north-east, the current enters the Niagara River, about half-way down which it leaps along a rocky ledge of 100 feet in height, to a lower level, forming the celebrated Falls of Niagara, and then passes on in a rapid course into Lake Ontario. The fall between the two lakes is 333 feet. Lake Ontario is 180 miles long and 65 miles wide. Out of its north-eastern end falls the broad stream which here generally takes the name of the Saint Lawrence, and which proceeds onward, now widening into lake-like expanses full of islands, now compressed into a narrow channel, in a north-easterly direction. The true Saint Lawrence may indeed be considered as traversing the whole system of the great lakes of



North America, and thus being little less than a thousand miles in direct length; indeed, including its windings, it is fully two thousand miles long. To the north-west of it exist countless numbers of small lakes united by a network of streams; while numerous large rivers, such as the Ottawa, the Saint Maurice, and the Saguenay, flow into it, and assist to swell its current. There are numerous other small lakes to the west of the Rocky Mountains, a large number of which exist in the Province of British Columbia, and are more or less connected with the Fraser and Columbia Rivers. Further to the south are other lakes, many of them of volcanic origin, some intensely salt, others formed of hot mud. Among these is the Great Salt Lake, in the State of Utah. To the south of the Saint Lawrence also is Lake Champlain, 105 miles long, though extremely narrow,—being only 10 miles in its widest part, narrowing in some places to half a mile. Near it is the beautiful Lake Saint George, with several other small lakes; and lastly, in Florida, there is a chain of small lakes, terminating in Lake Okechodee—a circular sheet of water about thirty miles in diameter.

We must now proceed more particularly to examine the regions of which we have obtained the preceding cursory view, but, before we do so, we must glance at their human inhabitants.

Aboriginal Inhabitants—The Red Men of the Wilds.

While the white men from Europe occupy the whole eastern coast, pressing rapidly and steadily westward, the Redskin aborigines maintain a precarious existence throughout the centre of the continent, from north to south, and are still found here and there on the western shores. On the northern ice-bound coast, the skin-clothed Esquimaux wander in small bands

from Behring Strait to Baffin Bay, but never venture far inland, being kept in check by their hereditary enemies, the Athabascas, the most northern of the red-skinned nations. The Esquimaux, inhabiting the Arctic regions, may more properly be described in the volume devoted to that part of the globe.

Indian Wigwams.

Here and there, in openings in the primeval forest, either natural or artificial, on the banks of streams and lakes, several small conical structures may be seen, composed of long stakes, stuck in the ground in circular form, and fastened at the top. The walls consist of large sheets of birch-bark, layer above layer, fastened to the stakes. On the lee-side is left a small opening for ingress and egress, which can be closed by a sheet of bark, or the skin of a wild animal. At the apex, also, an aperture is allowed to remain for the escape of the smoke from the fire which burns within. Lines are secured to the stakes within, on which various articles are suspended; while round the interior mats or skins are spread to serve as couches, the centre being left free for the fire. In front, forked stakes support horizontal poles, on which fish or skins are hung to dry; and against others, sheets of bark are placed on the weather-side, forming lean-tos, shelters to larger fires, used for more extensive culinary operations than can be carried on within the hut. On the shores are seen drawn up beautifully-formed canoes of birch-bark of various sizes—some sufficient to carry eight or ten men; and others, in which only one or two people can sit.

Appearance of the Indians.

Amid the huts may be seen human figures with dull copper or reddish-brown complexions, clothed in rudely-tanned skins of a yellowish or white hue, and ornamented with the teeth of animals and coloured grasses, or worsted and beads. Their figures are tall and slight. They have black, piercing eyes, slightly inclining downwards towards the nose, which is broad and large. They have thick, coarse lips, high and prominent cheek-bones, with somewhat narrow foreheads, and coarse, dark, glossy hair, without an approach to a curl; their heads sometimes adorned with feathered caps or other ornaments. Often their faces are besmeared with various coloured pigments in stripes or patches—one colour on one side of the face, the other being of a different hue. Their lower extremities are covered with leggings of leather, ornamented with fringes, and their feet clothed in mocassins of the same material as their

leggings. The men stalk carelessly about, or repair their canoes or fishing gear and arms; while the women sit, crouching down to the ground, bending over their caldrons, shelling Indian-corn, or engaged in some other domestic occupation; and the children, innocent of clothing, tumble about on the ground. In travelling, the Indian mother carries her child on her back. It is strapped to a board; and when a halting-place is reached, the cradle and the child are hung upon a tree, or on a pole inside the wigwam. Those who have communication with the whites may be seen clothed in blanket garments, which the men wear in the shape of coats; while the women swathe their bodies in a whole blanket, which covers them from their shoulders to their feet.

Though the men assume a grave and dignified air when a stranger approaches, they often indulge in practical jokes and laughter among themselves; and in seasons of prosperity, appear good-humoured and merry. The women, however, are doomed to lives of unremitting toil, from the time they become wives. They are compelled to carry the burdens, and to cultivate the ground, when any ground is cultivated, for the production of potatoes, maize, and tobacco. The men condescend merely to manufacture their arms and canoes, and to hunt; or they engage in what they consider the noblest of employments, waging war on their neighbours. The women, indeed, are often compelled to paddle the canoes, sometimes to go fishing, and to carry the portable property from place to place, or an overload of game when captured.

Intelligent as the Indian appears, it is evident that he has cultivated his perceptive powers to the neglect of his spiritual and moral qualities. His senses are remarkably acute. His memory is good; and when aroused, his imagination is vivid, though wild in the extreme. He is warmly attached to hereditary customs and manners. Naturally indolent and slothful, he detests labour, and looks upon it as a disgrace, though he will go through great fatigue when hunting or engaged in warfare.

Wood Indians.

The northern tribes are known as Wood Indians, in contradistinction to the inhabitants of the open country, the Prairie Indians, who differ greatly from the former in their habits and customs. All the tribes of the Athabascas, as well as those to the south of them, known as the Algonquins, are Wood Indians. They are nearly always engaged in hunting the wild animals of the region they inhabit, for the sake of their furs,

which they dispose of to the agents of the Hudson Bay Company and other traders, in exchange for blankets, firearms, hatchets, and numerous other articles, as well as too often for the pernicious fire-water, to obtain even small quantities of which they will frequently dispose of the skins which it has cost them many weeks to obtain with much hardship and danger. These Wood Indians are peaceably-disposed, and can always escape the attacks of their enemies of the prairies by retreating among their forest or lake fastnesses. They obtain their game by various devices, sometimes using traps of ingenious construction, or shooting the creatures with bows and arrows, and of later years with firearms. They spear the fish which abound in their waters, or catch them with scoop and other nets. Although their ordinary wigwams are of the shape already described, some are considerably larger, somewhat of a beehive form, covered thickly with birch-bark, and have a raised dais in the interior capable of holding a considerable number of people. The best-known of these Forest Indians are the Chippeways, who range from the banks of Lake Huron almost to the Rocky Mountains, throughout the British territory.

The Prairie Indians.

To the south of the tribes already mentioned, are the large family of the Dakotahs, who number among them the Sioux, Assiniboines, and Blackfeet, and are the hereditary enemies of the Chippeways, especially of their nearer neighbours, the Crees and Ojibbeways. These Dakotahs occupy the open prairie country to the south of the Saskatchewan, and are the most northern of the Prairie Indians. In summer, they wear little or no clothing; and possessing numerous horses, hunt the buffaloes, or rather bisons, on horseback, armed with spears and bows and arrows. They are fiercer and more warlike than their northern neighbours, and have long set the whites at defiance. The buffalo supplies them with their chief support. The flesh of the animal dried in the sun, or pounded with its fat into pemmican, is their chief article of food; while its skin serves as a covering for their tents, a couch at night, or for clothing by day, and is manufactured into bags for carrying their provisions, and numerous other articles. Physically, they are superior to the Wood Indians. They are both hunters and warriors; and though they may occasionally exchange the buffalo robes—as the skins are called—for firearms; they seldom employ themselves as trappers, or attend to the cultivation of the ground.

The greater number of the tribes further to the south possess horses, and hunt the buffalo and deer. Some are even more

savage than the Dakotahs, while others, again, have made slight progress towards civilisation, and live in settled villages, while they rudely cultivate the ground, and possess herds of cattle.

Although the Indian languages differ greatly from each other, a great similarity in grammatical structure and form has been found to exist among them, denoting a common, though remote origin. They differ, however, so greatly from any known language of the Old World, as to afford conclusive proof that their ancestors must have left its shores at an early period of the world's history.

The governments also differed. In some tribes it approached an absolute monarchy, the will of the sachem or chief being the supreme law; while in others it was almost entirely republican, the chief being elected for his personal qualities, though frequently the leadership was preserved in the female line of particular families.

When describing the customs of the Indians, we are compelled often to speak of the past, as the tribes, from being pressed together by the advancement of civilisation, have become amalgamated, and many of their customs have passed away. Most of the nations were divided into three or more clans or tribes, each distinguished by the name of an animal. Thus the Huron Indians were divided into three tribes—those of the Bear, the Wolf, and the Turtle. The Chippeways, especially, were divided into a considerable number of tribes.

Religious Belief.

Though their language differs so greatly, as do many of their customs, their religious notions exhibit great uniformity throughout the whole country. They all possess a belief, though it is vague and indistinct, in the existence of a Supreme, All-Powerful Being, and in the immortality of the soul, which, they suppose, restored to its body, will enjoy the future on those happy hunting-grounds which form the red man's heaven. They also worship numerous inferior deities or evil spirits, whom they endeavour to propitiate, under the supposition that unless they do so they may work them evil rather than good. They suppose that there is one god of the sun, moon, and stars; that the ocean is ruled by another god, and that storms are produced by the power of various malign beings; yet that all are inferior to the Supreme Ruler of the universe. We can trace in some of the tribes customs and notions which have been derived from those

of far-distant nations. Thus, the tribes of Louisiana kept a sacred fire constantly burning in their temples: the Natches, as did the Mexicans, worshipped the sun, from whom their chiefs pretended to be descended. By some tribes human sacrifices were offered up,—a custom which was practised by the Pawnees and Indians of the Missouri even to a late period. Several of the tribes buried their dead beneath their houses; and it was an universal custom among all to inter them in a sitting posture, clothed in their best garments, while their weapons and household utensils, with a supply of food, were placed in their graves, to be used when they might be restored to life. Several of their traditions evidently refer to events recorded in Scripture history. The Algonquin tribes still preserve one pointing to the upheaval of the earth from the waters, and of a subsequent inundation. The Iroquois have a tradition of a general deluge; while another tribe believe not only that a deluge took place, but that there was an age of fire which destroyed all things, with the exception of a man and woman, who were preserved in a cavern. Many similar traditions exist; while it is probable that those mentioned refer to the destruction of the Cities of the Plain by fire which came down from heaven, and to the confusion of tongues which fell upon the descendants of Noah in the plain of Shinar.

American Antiquities.

We are apt to suppose that the wild inhabitants of the New World have ever existed in the same savage state as that in which they are found. Vast numbers, however, of remains, and buildings of great antiquity, have of late years been discovered, showing that at one time either their ancestors, or other tribes who have passed away, had made great progress in civilisation. As the white man has advanced westward, and dug deep into the soil, whilst forming railway cuttings, digging wells, and other works, numerous interesting remains have been discovered—a large number of fortified camps of vast extent, and even the foundations of cities, with their streets and squares, have been brought to light. Idols, pitchers of clay, ornaments of copper, circular medals, arrowheads, and even mirrors of isinglass, in great numbers, have been found throughout the country. Some of the articles of pottery are skilfully wrought, and polished, glazed, and burned; inferior in no respects to those of Egypt and Babylon.

In Tennessee, an earthen pitcher, holding a gallon, was discovered on a rock twenty feet below the surface. It was surmounted by the figure of a female head covered with a

conical cap. The features greatly resembled those of Asiatics, and the ears, extending as low as the chin, were of great size. Near the Cumberland River an idol formed of clay was found about four feet below the surface of the earth. It is of curious construction, consisting of three hollow heads joined together at the back by an inverted bell-shaped hollow stem. This specimen also has strongly-marked Asiatic features; the red and yellow colour with which it is ornamented still retaining great brilliancy. Another idol, formed of clay and gypsum, was discovered near Nashville. It represented a human being without arms. The hair was plaited, and there was a band round the head with a flattened lump or cake upon the summit. Numerous medals, also, have been dug up, representing the sun, with its rays of light, together with utensils and ornaments of copper, sometimes plated with silver; and a solid silver cup, with its surface smooth and regular, and its interior finely gilt.

But besides these, and very many similar articles, throughout the whole country, and especially towards the west, immense numbers of fortresses of great size have been discovered, with walls of earth, some of them ten feet in height, and thirty in breadth. There is a vast fortress in Ohio, near the town of Newark. It is situated on an extensive plain, at the junction of two branches of the Muskingum. At the western extremity of the work stood a circular fort, containing twenty-two acres, on one side of which was an elevation thirty feet high, partly of earth and partly of stone. The circular fort was connected by walls of earth with an octagonal fort containing forty acres, the walls of which were ten feet high. At this end were eight openings or gateways about fifteen feet in width, each protected by a mound of earth on the inside. From thence four parallel walls of earth proceeded to the basin of the harbour, others extending several miles into the country, and others on the east joined to a square fort containing twenty acres, not four miles distant. From this latter fort parallel walls extended to the harbour, and others to another circular fort one mile and a half distant, containing twenty-six acres, and surrounded by an embankment from twenty-five to thirty feet high. Further north and east the elevated ground was protected by intrenchments. Traces of other walls have been found, apparently connecting these works with those thirty miles distant. When we come to reflect that there were many hundreds of similar forts, some of which were of equal size, and others even of still greater magnitude, we cannot help believing that an enormous population, considerably advanced in the arts of civilisation, must at one time have existed in the country, over which for ages past the untutored savage has roamed in almost a state of

nature. And now these wild tribes are rapidly disappearing before the advancement of a still greater multitude, and a far more perfect civilisation. Whether these ancient races were the ancestors of the present Indians or not, it is difficult to determine, as are the causes of their disappearance. It is possible that, retreating southward, they established the empires of Mexico and Peru, or, overcome by more savage tribes, were ultimately exterminated.

Part 1—Chapter II.

North America considered as divided into Four Zones, with the various Objects of Interest found in each.

The North American continent may be divided into four zones or parallel regions, which, from the difference in temperature which exists between them, present a great variety both in their fauna and flora.

The First Zone.

Commencing on the east, where the Greenland Sea washes the coast of Labrador, and Hudson Strait leads to the intricate channels communicating with the Arctic Ocean, we have on the first-named coast a low and level region, which rises inland to a considerable elevation, and then once more sinks on the shores of Hudson Bay. West of that bay there is a wide extent of low country, intermixed with numerous lakes and marshes; and then along the Arctic shore is a wild, barren, treeless district, rising at length into the mountainous region of the Arctic highlands. Amid them numerous rapid streams find their way into the Arctic Ocean. Again they sink into the basin of the Mackenzie River, which separates the in from the northern end of the Rocky Mountains. Hence westward to the Pacific is a broad highland region, rising into the lofty range of the Sea Alps.

The Second Zone.

The Fertile Belt of Rupert's Land.

The next Zone we will consider as commencing at the Gulf of Saint Lawrence. Westward extends an elevated region, rising in many places to a considerable height, and forming the water-

shed of the rivers which flow on the south side into the Saint Lawrence, and on the north into Hudson Bay. Proceeding up the Saint Lawrence, we arrive at a great lake district, which embraces Lakes Ontario, Erie, Huron, Michigan, and Superior, to the extreme west. On the north-western shores of that lake we find an elevated district with several small lakes and streams flowing through valleys. This is the water-shed also of two systems. The streams to the east, flowing into Lake Superior, ultimately enter the Saint Lawrence; while those to the west make their way into Lake Winnipeg, the waters of which, after flowing through a variety of channels, fall into Hudson Bay. To the west of this water-shed range the first lake we meet with is known as the Lac des Milles Lacs. Two rivers flow from it, expanding here and there into small lakes, till another expanse of water is reached called Rainy Lake. This in the same way communicates by two streams with the still larger Lake of the Woods, the whole region on both sides being thickly wooded. From the Lake of the Woods flows the broad and rapid Winnipeg River, which finally falls into Lake Winnipeg. This large and long lake is connected with several others of smaller size,—Lake Winnipegosis and Manitoba Lake to the west of it. Into the southern end of Lake Winnipeg flows the Red River, which rises far-away in the south in the United States, taking an almost direct northerly course. Towards the north, about twenty miles from the lake, is situated the well-known Selkirk settlement. To the west of the Red River commences a broad belt of prairie land which extends here and there, rising into wooded heights and swelling hills, with several large rivers flowing through it, to the very base of the Rocky Mountains. As we advance westward we find it extending considerably to the north, where the large and wide river Saskatchewan, rising in the Rocky Mountains, flows eastward into Lake Winnipeg. Along the southern border of this region the Assiniboine River, also of considerable size, flows into the Red River at Fort Garry, in the Selkirk settlement. The prairie country indeed extends further than the Red River, up to the Lake of the Woods. The name of the Fertile Belt has been properly given to it. Commencing at the Lake of the Woods, it stretches westward for 800 miles, and averages from 80 to upwards of 100 miles in width. The area of this extraordinary belt of rich soil and pasturage is about 40,000,000 of acres. Including the adjacent fertile districts, the area may be estimated at not less than 80,000 square miles, or considerably more fertile land than the whole of Canada is supposed to contain. It rises gradually towards the west, so that the traveller is surprised to find how speedily he has gained the passes which lead him over the Rocky Mountains into the territory of British Columbia on their western side—often indeed

before he has realised the fact that he has crossed the boundary-line. The Fertile Belt is considerably more to the south than the British Islands, though, as the western hemisphere is subject to greater alternations of heat and cold than the eastern, there is a vast difference in temperature between the summer and winter. While in winter the whole region is covered thickly with snow, in summer the heat is so great that Indian-corn and other cereals, as well as all fruits, ripen with great rapidity. The whole of this fertile region, which now forms part of the Canadian Dominion, is about to be opened to colonisation; and through it will be carried the great high road which will connect the British provinces on the Pacific with those of the Atlantic.

Animal Life on the Fertile Belt.

Throughout this fine region range large herds of buffalo,—not extending their migrations, however, beyond its northern boundary. Here, too, are found two kind of small deer—the wapiti, and the prong-horned antelope. Hares—called rabbits, however—exist in great numbers. Porcupines are frequently found. The black bear occasionally comes out of the neighbouring forests, while a great variety of birds frequent the lakes and streams, whose waters also swarm with numerous fish. The white fish found in the lakes are much esteemed, and weigh from two or three to seven pounds. There are fine pike also. Sturgeon are caught in Lake Winnipeg and the Lower Saskatchewan of the weight of 160 pounds. Trout grow to a great size, and there are gold-eyes, suckers, and cat-fish. Unattractive as are the names of the two last, the fish themselves are excellent. Among the birds, Professor Hind mentions prairie-hens, plovers, various ducks, loons, and other aquatic birds, besides the partridge, quail, whip-poor-will, hairy woodpecker, Canadian jay, blue jay, Indian hen, and woodcock. In the mountain region are bighorns and mountain goats; the grizzly bear often descends from his rugged heights into the plains, and affords sport to the daring hunter. The musk-rat and beaver inhabit the borders of the lakes. The cariboo and moose frequent the Fertile Belt, though the musk-ox confines himself to the more northern regions. Wolves have been almost exterminated in the neighbourhood of the Red River settlement. The half-breeds and Indians possess peculiarly hardy and sagacious horses, which are trained for hunting the buffalo. Their dogs are large and powerful, and four of them will draw a sleigh with one man over the snow at the rate of six miles an hour. Herds of cattle, as well as horses and hogs, are left out during the whole winter, it being necessary only—should a thaw

come on, succeeded by a frost—to supply them with food; otherwise, unable to break through the coating of ice thus formed, they are liable to starve.

The farmers of the Red River settlement grow wheat, barley, oats, flax, hemp, hops, turnips, and even tobacco, though Indian-corn grows best, and can always be relied on. Wheat, however, is the staple crop of Red River. It is a splendid country for sheep pasturage, and did easier means of transporting the wool exist, or could it be made into cloth or blankets in the settlement, no doubt great attention would be given to the rearing of sheep.

The Third Zone—The Dismal Swamp in the United States.

Returning again to the east coast, about the latitude of Chesapeake Bay and Cape Hatteras, we find a low level region known as the Atlantic plain, running parallel to the coast, on which the long-leaved or peach-pines flourish. This region is generally called the Pine Barrens. Wild vines encircle the trees, and among them are seen the white berries of the mistletoe. In winter these Pine Barrens retain much of their verdure, and constitute one of the marked features of the country. Amid them are numerous swamps or morasses. One of great size, extending to not less than forty miles from north to south, and twenty-five in its greatest width, is called the Great Dismal Swamp.

The soil, black as in a peat-bog, is covered with all kinds of aquatic trees and shrubs; yet, strange to say, instead of being lower than the level of the surrounding country, it is in the centre higher than towards its margin; indeed, from three sides of the swamp the waters actually flow into different rivers at a considerable rate. Probably the centre of the morass is not less than twelve feet above the flat country around it. Here and there some ridges of dry land appear, like low islands, above the general surface. On the west, however, the ground is higher, and streams flow into the swamp, but they are free from sediment, and consequently bring down no liquid mire to add to its substance. The soil is formed completely of vegetable matter, without any admixture of earthy particles. In many even of the softest parts juniper-trees stand firmly fixed by their long tap roots, affording a dark shade, beneath which numerous ferns, reeds, and shrubs, together with a thick carpet of mosses, flourish, protected from the rays of the sun. Here and there also large cedars and other deciduous trees have grown up. The black soil formed beneath, increased by the

rotting vegetation, is quite unlike the peat of Europe, as the plants become so decayed as to leave no traces of organisation. Frequently the trees are overthrown, and numbers are found lying beneath the surface of the soil, where, covered with water, they never decompose. So completely preserved are they, that they are frequently sawn up into planks. In one part of the Dismal Swamp there is a lake seven miles in length, and more than five wide, with a forest growing on its banks. The water is transparent, though tinged with a pale brown colour, and contains numerous fish. The region is inhabited by a number of bears, who climb the trees in search of acorns and gumberries, breaking off the boughs of the oaks in order to obtain the acorns; these bears also kill hogs, and even cows. Occasionally a solitary wolf is seen prowling over the morass, and wild cats also clamber amid its woods. Even in summer, the air, instead of being hot and pestiferous, is especially cool, the evaporation continually going on in the wet spongy soil generating an atmosphere resembling that of a region considerably elevated above the level of the ocean. Canals have been cut through this swamp. They are shaded by tall trees, their branches almost joining across, and throwing a dark shade on the water, which itself looks almost black, and adds to the gloom of the region. Emerging from one of these avenues into the bright sunlit lake, the aspect of the scenery is like that of some beautiful fairyland.

Fossil Footmarks of Birds.

A considerable way to the north of this region, on the banks of the Connecticut River, are beds of red sandstone, on the different layers of which are found the footmarks of long extinct birds. The beds in some parts are twenty-five feet in thickness, composed of layer upon layer; and on each of these layers, when horizontally split, are found imprinted these remarkable footmarks. This result could only have been produced by the subsidence of the ground, fresh depositions of sand having taken place on the layers, on which the birds walked after the subsidence. They must have been of various sizes,—some no larger than a small sand-piper, while others, judging from their footprints, which measure no less than nineteen inches, must have been twice the size of the modern African ostrich. The distances between the smaller measure only about three inches, but in the base of the largest, called the *Ornithichnites Gigas*, they are from four to six feet apart. In some places where the birds have congregated together none of the steps can be distinctly traced, but at a short distance from this area the tracks become more and more distinct. Upwards of two thousand such footprints have been observed, made probably

by nearly thirty distinct species of birds, all indented on the upper surface of the strata, and only exhibiting casts in relief on the under side of the beds which rested on such indented surfaces. In other places the marks of rain and hail which fell countless ages ago are clearly visible. Sir Charles Lyell perceived similar footprints in the red mud in the Bay of Fundy, which had just been formed by sandpipers; and on examining an inferior layer of mud, formed several tides before, and covered up by fresh sand, he discovered casts of impressions similar to those made on the last-formed layer of mud. Near the footsteps he observed the mark of a single toe, occurring occasionally, and quite isolated from the rest. It was suggested to him that these marks were formed by waders, which, as they fly near the ground, often let one leg hang down, so that the longest toe touches the surface of the mud occasionally, leaving a single mark of this kind. He brought away some slabs of the recently formed mud, in order that naturalists who were sceptical as to the real origin of the ancient fossil ornithichnites might compare the fossil products lately formed with those referable to the feathered bipeds which preceded the era of the ichthyosaurus and iguanodon.

The Big-Bone Lick.

We will now cross the Alleghanies westward, where we shall find a thickly-wooded country. As we proceed onwards, entering Kentucky, we reach a spot of great geological interest, called the Big-bone Lick.

These licks exist in various parts of the country. They are marshy swamps in which saline springs break out, and are frequented by buffalo, deer, and other wild animals, for the sake of the salt with which in the summer they are incrustated, and which in winter is dissolved in the mud. Wild beasts, as well as cattle, greedily devour this incrustation, and will burrow into the clay impregnated with salt in order to lick the mud. In the Big-Bone Lick of Kentucky the bones of a vast number of mastodons and other extinct quadrupeds have been dug up.

This celebrated bog is situated in a nearly level plain, bounded by gentle slopes, which lead up to wide-extended table-lands. In the spots where the salt springs rise, the bog is so soft that a man may force a pile into it many yards perpendicularly. Some of these quaking bogs are even now more than fifteen acres in extent, but were formerly much larger, before the surrounding forest was partially cleared away. Even at the present day cows, horses, and other quadrupeds are occasionally lost here, as

they venture on to the treacherous ground. It may be easily understood, therefore, how the vast mastodons, elephants, and other huge animals lost their lives. In their eagerness to drink the saline waters, or lick the salt, those in front, hurrying forward, would have been pressed upon by those behind, and thus, before they were aware of their danger, sank helplessly into the quagmire. It is supposed that the bones of not less than one hundred mastodons and twenty elephants have been dug up out of the bog, besides which the bones of a stag, extinct horse, megalonyx, and bison, have been obtained. Undoubtedly, therefore, this plain has remained unchanged in all its principal features since the period when these vast extinct quadrupeds inhabited the banks of the Ohio and its tributaries. Here and there the Big-bone Lick is covered with mud, washed over it by some unusual rising of the Ohio River, which is known to swell sixty feet above its summer level.

Passing on through wide-spreading prairies, we cross the mighty stream of the Mississippi to a slightly elevated district of broad savannahs, till we reach a treeless region bordering the very foot of the Rocky Mountains. Through this region numerous rivers pass on their way to the Mississippi. Leaving at length the great western plain, we begin to mount the slopes of the Rocky Mountains, when we may gaze upwards at the lofty snow-covered peaks above our heads. Hence, crossing the mighty range in spite of grizzly bears and wilder Indians, we descend towards the bank of the Rio Colorado, which falls into the Gulf of California, and thence over a mountainous region, some of whose heights, as Mount Dana, reach an elevation of 13,000 feet, and Mount Whitney, 15,000 feet.

The Fourth Zone.

The southernmost of the four zones begins on the coast of Florida, passes for hundreds of miles over a low or gently sloping country toward the great western plains which border the Rocky Mountains into Texas; its southern boundary being the Gulf of Mexico. Through this region flow numerous rivers, the queen of which is the Mississippi. The western portion is often wild and barren in the extreme, inhabited only by bands of wild and savage Indians. The Rocky Mountains being passed, there is a lofty table-land, and then rise the Sierras de los Nimbres and Madre; beyond which, bordering the Gulf of California, is the wild, grandly picturesque province of Sonora, with its gigantic trees and stalactite caves.

Part 1—Chapter III.

The Prairies, Plains of the West, and Passes of the Rocky Mountains.

To obtain, however, a still more correct notion of the appearance of the continent, we must take another glance over it. We shall discover, to the north, and throughout the eastern portion where civilised man has not been at work dealing away the trees, a densely-wooded region. Proceeding westward, as the valley of the Mississippi is approached the underwood disappears, and oak openings predominate. These Oak Openings, as they are called, are groves of oak and other forest-trees which are not connected, but are scattered over the surface at a considerable distance from one another, without any low shrub or underbrush between them.

The Prairies.

Thus, gradually, we are entering the prairie country, which extends as far west as the Grand Coteau of the Missouri. This prairie region is covered with a rich growth of grass; the soil is extremely fertile, and capable of producing a variety of cereals. Over the greater portion of the prairie country, indeed, forests of aspens would grow, did not annual fires in most parts arrest their progress. Here and there numbers have sprung up. The true prairie region in the United States extends over the eastern part of Ohio, Indiana, the southern portion of Michigan, the southern part of Wisconsin, nearly the whole of the states of Illinois and Iowa, and the northern portion of Missouri, gradually passing—in the territories of Kansas and Nebraska—into that arid and desert region known as The Plains, which lie at the base of the Rocky Mountains.

The Grand Coteau de Missouri forms a natural boundary to these arid plains. This vast table-land rises to the height of from 400 to 800 feet above the Missouri. Vegetation is very scanty; the Indian turnip, however, is common, as is also a species of cactus. No tree or shrub is seen; and only in the bottoms or in marshes is a rank herbage found. Across these desert regions the trails of the emigrant bands passing to the Far West have often been marked: first, in the east, by furniture and goods abandoned; further west, by the waggons and carts of the ill-starred travellers; then by the bones of oxen and horses bleaching on the plain; and, finally, by the graves, and sometimes the unburied bodies, of the emigrants themselves, the survivors having been compelled to push onwards with the

remnant of their cattle to a more fertile region, where provender and water could be procured to restore their well-nigh exhausted strength. Oftentimes they have been attacked by bands of mounted Indians, whose war-whoop has startled them from their slumbers at night; and they have been compelled to fight their way onwards, day after day assailed by their savage and persevering foes.

Civilised man is, however, triumphant at last, and the steam-engine, on its iron path, now traverses that wild region from east to west at rapid speed; and the red men, who claim to be lords of the soil, have been driven back into the more remote wilderness, or compelled to succumb to the superior power of the invader, in many instances being utterly exterminated. Still, north and south of that iron line the country resembles a desert; and the wild Indian roams as of yore, like the Arab of the East—his hand against every man, and every man's hand against him.

Among the dangers to which the traveller across the prairie is exposed, the most fearful is that of fire. The sky is bright overhead; the tall grass, which has already assumed a yellow tinge from the heat of summer, waves round him, affording abundant pasture to his steed. Suddenly his guides rise in their stirrups and look anxiously towards the horizon. He sees, perhaps, a white column of smoke rising in the clear air. It is so far-off that it seems it can but little concern them. The guides, however, think differently, and after a moment's consultation point eagerly in the direction of some broad river, whose waters flow towards the Mississippi. "Onward! onward!" is the cry. They put spurs to their horses' flanks, and gallop for their lives. Every instant the column of smoke increases in width, till it extends directly across the horizon. It grows denser and denser. Now above the tall grass flashes of bright light can be seen. The traveller almost fancies he can hear the crackling of the flames as they seize all combustible substances in their course. Now they surround a grove of aspens, and the fierce fire blazes up more brightly than ever towards the sky, over which hangs a dark canopy of smoke. Suddenly a distant tramp of feet is heard. The very ground trembles. A dark mass approaches—a phalanx of horns and streaming manes. It is a herd of buffaloes, turned by the fire purposely ignited by the Indians. The guides urge the travellers to increase their speed; for if overtaken by the maddened animals, they will be struck down and trampled to death. Happily they escape the surging herd which comes sweeping onward—thousands of dark forms pressed together, utterly regardless of the human beings who have so narrowly

escaped them. The travellers gallop on till their eyes are gladdened by the sight of the flowing waters of a river. They rush down the bank. Perchance the stream is too rapid or too deep to be forded. At the water's edge they at length dismount, when the Indians, drawing forth flint and steel, set fire to the grass on the bank. The smoke well-nigh stifles them, but the flames pass on, clearing an open space; and now, crouching down to the water's edge, they see the fearful conflagration rapidly approaching. The fire they have created meets the flames which have been raging far and wide across the region. And now the wind carries the smoke in dense masses over their heads; but their lives are saved—and at length they may venture to ride along the banks, over the still smouldering embers, till a ford is reached, and they may cross the river to where the grass still flourishes in rich luxuriance.

While, on one side of the stream, charred trees are seen rising out of the blackened ground, on the other all is green and smiling. These fearful prairie fires, by which thousands of acres of grass and numberless forests have been destroyed, are almost always caused by the thoughtless Indians, either for the sake of turning the herds of buffaloes towards the direction they desire them to take, or else for signals made as a sign to distant allies. Sometimes travellers have carelessly left a camp-fire still burning, when the wind has carried the blazing embers to some portion of the surrounding dry herbage, and a fearful conflagration has been the result.

Mr Paul Kane, the Canadian artist and traveller, mentions one which he witnessed from Fort Edmonton. The wind was blowing a perfect hurricane when the conflagration was seen sweeping over the prairie, across which they had passed but a few hours before. The night was intensely dark, adding effect to the brilliancy of the flames, and making the scene look truly terrific. So fiercely did the flames rage, that at one time it was feared the fire would cross the river to the side on which the fort is situated, in which case it and all within must have been destroyed. The inmates also had had many apprehensions for the safety of one of their party, from whom, with his Indians, Mr Kane had parted some time before, and who had not yet arrived. For three days they were uncertain of his fate, when at length their anxiety was relieved by his appearance. He had noticed the fire at a long distance, and had immediately started for the nearest bend in the river. This, by great exertion, he had reached in time to escape the flames, and had succeeded in crossing.

The Barren Plains in the Far West.

On the prairies of the east the eye ranges over a wide expanse of waving grass, everywhere like the sea. As, crossing the plains, we proceed west towards the vast range of the Rocky Mountains, the country gives evidence of the violent and irregular disturbances to which it has been subjected. Wild rocky ridges crop out from the sterile plains of sand; and for hundreds of miles around the country is desert, dry, and barren. Even the vegetation, such as it is, is of the same unattractive character. The ground here and there is covered with patches of the grey gramma grass, growing in little cork-screw curls; and there is a small fuzzy plant, the under sides of the leaves of which are covered with a white down, while occasionally small orange-coloured flowers are seen struggling into existence.

There are insects, however. Ants swarm in all directions, building cones a foot in height. Grasshoppers in myriads, with red wings and legs, fly through the air—the only bright objects in the landscape. Sometimes the reddish-brown cricket is seen. Even the Platte River, which flows through this region, partakes of its nature. It seems to consist of a saturated solution of sand: when a handful is taken up, a grey mud of silex remains in the palm. Dry as this gramma grass appears, it possesses nutritive qualities, as the animals which feed on it abundantly prove.

Storms break over these plains with tremendous fury: the thunder roars, the lightning which flashes from the clouds illumines earth and sky with a brightness surpassing the cloudless noon. Then again utter darkness covers the earth, when suddenly a column of light appears, like the trunk of some tall pine, as the electric fluid passes from the upper to the lower regions of the world. The next instant its blazing summit breaks into splinters on every side. Occasionally fearful hail-storms sweep over the plains; and at other times the air from the south comes heated, as from a furnace, drying up all moisture from the skin, and parching the traveller's tongue with thirst.

Here and there are scattered pools of water containing large quantities of salts, soda, and potash, from drinking which numbers of cattle perish. The track of emigrants is strewn for many miles with bleaching heads, whole skeletons, and putrefying carcasses;—the result of the malady thus produced, in addition to heat and overdriving. Even the traveller suffers greatly, feeling as if he had swallowed a quantity of raw soda.

Yet often in this generally desert region, where the rivers wind their way through the plain, or wide pools of pure water mirror the blue sky, scenes of great beauty are presented. Nothing can surpass the rosy hues which tinge the heavens at sunrise. Here game of all sorts is found. The lakes swarm with mallards, ducks, and a variety of teal. Herds of antelopes cross the plain in all directions, and vast herds of buffalo darken the horizon as they sweep by in their migrations.

The Rocky Mountains.

At length a blue range, which might be taken for a rising vapour, appears in the western horizon. It is the first sight the traveller obtains of the long-looked-for Rocky Mountains; yet he has many a weary league to pass before he is among them, and dangers not a few before he can descend their western slopes. At length he finds himself amid masses of dark brown rocks, not a patch of green appearing; mountain heights rising westward, one beyond the other; and far-away, where he might suppose the plains were again to be found, still there rises before him a region of everlasting snow. For many days he may go on, now climbing, now descending, now flanking piles of rocks, and yet not till fully six days are passed is he able to say that he has crossed that mountain range. Indeed, the term "range" scarcely describes the system of the Rocky Mountains. It is, in fact, a chain, composed of numerous links, with vast plains rising amid them.

Parks.

These ranges in several places thin out, as it were, leaving a large tract of level country completely embosomed in snowy ridges in the very heart of the system. These plains are known as "parks." They are found throughout the range. Several of them are of vast extent,—the four principal ones forming the series called, in their order, "North," "Middle," "South," and "Saint Louis" Parks. Portions of them, thoroughly irrigated, remain beautifully green throughout the year, and herbage over the whole region is abundant. Sheltered from the blasts to which the lower plains are exposed, these parks enjoy an equable climate; and old hunters, who have camped in them for many seasons, describe life there as an earthly paradise. They abound in animals of all sorts. Elk, deer, and antelope feed on their rich grasses. Hither also the puma follows its prey, and there are several other creatures of the feline tribe. Bears, wolves, and foxes likewise range across them. In some of them herds of buffalo pass their lives; for, unlike their brethren of the

plain, they are not migratory. It is doubtful whether or not they are of the same species, but they are said to be larger and fiercer.

The appropriate designation of the Rocky Mountain-system is that of a chain. On crossing one of its basins or plateaux, the traveller finds himself within a link such as has just been described. A break in one of these links is called a "pass," or "canon." As he passes through this break he enters another link, belonging to another parallel either of a higher or lower series. In some of the minor plateaux between the snowy ridges no vegetation appears. Granite and sandstone rocks outcrop even in the general sandy level, rising bare and perpendicularly from 50 to 300 feet; as a late traveller describes it, "looking like a mere clean skeleton of the world." Nothing is visible but pure rock on every side. Vast stones lie heaped up into pyramids, as if they had been rent from the sky. Cubical masses, each covering an acre of surface, and reaching to a perpendicular height of thirty or forty feet, suggest the buttresses of some gigantic palace, whose superstructure has crumbled away with the race of its Titanic builders. It is these regions especially which have given the mighty range the appropriate name of the *Rocky Mountains*.

The Sage Cock.

In some spots, the limitless wastes are covered by a scrubby plant known as mountain sage. It rises from a tough gnarled root in a number of spiral shoots, which finally form a single trunk, varying in circumference from six inches to two feet. The leaves are grey, with a strong offensive smell resembling true sage. In other places there appear mixed with it the equally scrubby but somewhat greener grease-wood—the two resinous shrubs affording the only fuel on which the emigrant can rely while following the Rocky Mountain trail.

These sage regions are the habitation of a magnificent bird—the Sage Cock. He may well be called the King of the grouse tribe. When stalking erect through the sage, he looks as large as a good-sized wild turkey—his average length being, indeed, about thirty-two inches, and that of the hen two feet. They differ somewhat, according to the season of the year. The prevailing colour is that of a yellowish-brown or warm grey, mottled with darker brown, shading from cinnamon to jet-black. The dark spots are laid on in a longitudinal series of crescents. The under parts are a light grey, sometimes almost pure white, barred with streaks of brown, or pied with black patches. In the

elegance of his figure and fineness of his outlines he vies with the golden pheasant. His tail differs from that of the grouse family in general by coming to a point instead of opening like a fan. On each side of his neck he has a bare orange-coloured spot, and near it a downy epaulet. His call is a rapid "Cut, cut, cut!" followed by a hollow blowing sound. He has the partridge's habit of drumming with his wings, while the hen-bird knows the trick of misleading the enemy from her young brood. He seldom rises from the ground, his occasional flights being low, short, and laboured. He runs with great speed, and in his favourite habitat dodges and skulks with rapidity, favoured by the resemblance of his colour to the natural tints of the scrub. Though sometimes called the Cock of the Plains, he never descends into the plains, being always found on the higher mountain regions.

When the snow begins to melt, the sage hen builds in the bush a nest of sticks and reeds artistically matted together, and lays from a dozen to twenty eggs, rather larger than those of the domestic fowl, of a tawny colour, irregularly marked with chocolate blotches on the larger end. When a brood is strong enough to travel, the parents lead their young into general society. They are excessively tame, or bold. Often they may be seen strutting between the gnarled trunk and ashen masses of foliage peculiar to the sage scrub, and paying no more attention to the traveller than would a barnyard drove of turkeys; the cocks now and then stopping to play the dandy before their more Quakerly little hens, inflating the little yellow pouches of skin on either side of their necks, till they globe out like the pouches of a pigeon.

Winter Scene among the Rocky Mountains.

Descending the precipitous slopes of the Rocky Mountains on the west, we enter on a vast plain no less than 2000 miles in length, though comparatively narrow—the great basin of California and Oregon. Its greatest width, from the Sierra Nevada to the Rocky Mountains, is nearly 600 miles, but is generally much less. The largest lake found on it is 4200 feet above the level of the sea, and is connected with the Salt Lake of Utah. The mean elevation of the plain is about 6000 feet above the sea. A mountain-chain runs across it, and through it flows the large Colorado River, amidst gorges of the most picturesque magnificence.

If the scenes we have described are stern and forbidding in summer, how much more so are they in winter, when icy blasts

blow through the cañons, and masses of snow cover the ground. From one of the outer spurs on the east, let us take a glance over the region. Behind us rises the chain of the Rocky Mountains, the whole intermediate country, as well as the mountains themselves, except where the precipitous rocks forbid it, being covered thickly with snow. Rugged peaks and ridges, snow-clad and covered with pines, and deep gorges filled with broken rocks, everywhere meet the eye. To the east, the mountains gradually smooth away into high spurs and broken ground, till they join the wide-spreading plains, generally stretching far as the eye can reach, and hundreds of miles beyond—a sea of barrenness, vast and dismal. A hurricane blows clouds of white snowy dust across the desert, resembling the smoke of bonfires, roaring and raving through the pines on the mountain-top, filling the air with snow and broken branches, and piling it in huge drifts against the trees.

The perfect solitude of this vast wilderness is appalling. From our lofty post on the mountain-top, we obtain a view over the rugged and chaotic masses of the stupendous chain, and the vast deserts which stretch away far from its eastern base; while on all sides are broken ridges and chasms and ravines, with masses of piled-up rocks and uprooted trees, with clouds of drifting snow flying through the air, and the hurricane's roar battling through the forest at our feet adding to the wildness of the scene, which is unrelieved by the slightest vestige of animal or human life.

The Horned Frog.

We must now pass in review some of the numerous animals which inhabit these regions. In some of the mountain plateaux, among the cactuses and sand-heaps, we find that singularly-made animal known vulgarly as the Texan toad or horned frog—a name which in no way properly belongs to him, as he is more nearly related to the lizards and salamanders. He lives as contentedly on the hot baked prairies of Texas, as amongst their snow-surrounded heights; though, from his appearance, we should expect to see him basking under a semi-tropical sun, rather than in this region. Yet here he lives, and must often have to spend much of his time under the snow. These toads, as the creatures are called, have brown backs, white bellies, small twinkling black eyes, set in almond-shaped slits, enclosed by two dark marks of the same shape. This has the effect of enlarging the eye, and giving it a soft look like that of the antelope. The two retro-curved horns, which rise out of bony sockets above the eyes, add still more to this odd resemblance.

The skin of the back and the long stiff tail, instead of being warted like the true toad's upper surface, is set with thorny excrescences. That of the lower surface is a dry tough tissue, almost horny. Whether this armour is given him to defend himself from the rattlesnake, it is difficult to say. The creature itself is of a peaceable disposition; and so unwilling is he to fight, that he will allow himself to be taken in the hand, and if placed on it directly after capture, he will not attempt to get away. It is very easy to catch him in the first place, for his movements over the loose sand of his haunts are scarcely faster than those of a land tortoise.

The trappers and other scattered inhabitants of this region describe a fish with hands as frequenting the brooks and pools. Though there are, no doubt, some curious fish, it is questionable how far these creatures possess the members ascribed to them.

Fur-Trappers of the Far West.

The fur-trapper of America is the chief pioneer of the Far West. His life spent in the remote wilderness, with no other companion than Nature herself, his character assumes a mixture of simplicity and ferocity. He knows no wants beyond the means of procuring sufficient food and clothing. All the instincts of primitive man are constantly kept alive. Exposed to dangers of all sorts, he becomes callous to them, and is as ready to destroy human as well as animal life as he is to expose his own. He cares nothing for laws, human or divine. Strong, active, hardy, and daring, he depends on his instinct for the support of life.

The independent trapper possesses traps and animals of his own, ranges wherever he lists through the country, and disposes of his peltries to the highest bidder. There are others employed by the fur companies, who supply them with traps and animals, and pay a certain price for the furs they bring.

The independent trapper equips himself with a horse and two or three mules—the one for the saddle, the others for his packs—and a certain number of traps, which he carries in a leather bag, with ammunition, a few pounds of tobacco, and dressed deerskins for his mocassins and repairing his garments. His costume is a hunting-shirt of dressed buckskin, ornamented with long fringes; pantaloons of the same material, decorated with porcupine quills and long fringes down the outside of the leg. He has mocassins on his feet, and a flexible felt hat on his

head. Over his left shoulder and under his right arm hang his powder-horn and bullet-pouch, with flint, steel, and other articles, in a bag. A belt round the waist secures a large knife in a sheath of buffalo hide to a steel chain, as also a case of buckskin, containing a whetstone. In his belt is also stuck a tomahawk, a pipe-holder hangs round his neck, and a long heavy rifle is slung over his shoulder.

Arrived on the hunting-ground, as soon as the ice has broken up he follows the creeks and streams, keeping a lookout for the signs of beavers. As soon as he discovers one, he sets his trap, secured to a chain fastened to a stake or tree, baiting it with the tempting castoreum. He is ever on the watch for the neighbourhood of Indians, who try to outwit him, though generally in vain, to steal his traps and beavers. His eye surveys the surrounding country, and instantly detects any sign of his foes. A leaf turned down, the slightly pressed grass, the uneasiness of the wild animals, the flight of birds, all tell him that other human beings are in the neighbourhood. Sometimes, after he has set his traps and is returning to his camp, the wily Indian who has been watching follows, and a home-drawn arrow, shot within a few feet, never fails to bring the hapless victim to the ground. For one white scalp, however, that dangles in the smoke of an Indian's lodge, a dozen black ones surround the camp-fires of the trappers' rendezvous. Here, after the hunt, from all quarters the hardy trappers bring in their packs of beaver to meet the purchasers, sometimes to the value of a thousand dollars each. The traders sell their goods at enormous profits; and the thoughtless trapper, indulging in the fire-water from which he has long abstained, is too often induced to gamble away the gold for which he has risked life and gone through so many hardships. When all is gone, he gets credit for another equipment, and sets off alone, often to return and repeat the same process, although the profits of one or two successful hunts would enable him to stock a farm and live among civilised men.

Wonders of Nature.—Mammoth Cave of Kentucky.

There are many other wonders of Nature in different parts of North America well worthy of more notice than we can give them. The most remarkable, perhaps, is the Mammoth Cave of Kentucky. The entrance to it is situated near Green River, midway between Louisville and Nashville.

A lonely road leads to the entrance, from which, as we approach it in summer, we find a peculiarly chilly air issue forth. The sombre gloom of the entrance does not prepare us for the

enormous hall within; long avenues leading into vast chambers, the smaller, thirty feet in height, at least, with an area of half an acre, and, as we get lower and lower, increasing in height. Upwards of eighteen miles of the cavern have been explored, and it may possibly be of still greater extent. To give an idea of the height of one of the chambers, we may add that the rocks from above have fallen, and a hill has been formed one hundred feet in elevation. Many of the halls are ornamented with the most magnificent stalactites. One of them is appropriately called Martha's Vineyard, in consequence of having its tops and sides covered with stalactites which resemble bunches of grapes.

Several streams pass through the cavern, down the sides of which rush numerous cataracts. Some of these streams, which are of considerable depth and width, are inhabited by shoals of eyeless fish, the organs of sight being superfluous in a region doomed to eternal night. The atmosphere of this huge cave is peculiarly dry, and is supposed to be extremely serviceable to persons afflicted with pulmonary complaints.

To visit any considerable portion of the cavern would occupy us at least a couple of days. It is calculated there are no less than two hundred and twenty-six avenues, forty-seven domes, numerous rivers, eight cataracts, and twenty-three pits,—many of which are grand in the extreme. Some of the rivers are navigated by boats, and, as may be supposed, they have obtained appropriate names. Here we find the Dead Sea and the River Styx. One of the streams disappears beneath the ground, and then rises again in another portion of the cavern. But after all, as naturalists, the little eyeless fish should chiefly claim our attention.

Oil Springs.

As coal was stored up for the use of man, formed in ages past from the giant vegetation which then covered the face of the earth, so the Creator has caused to be deposited in subterranean caverns large quantities of valuable oil, which not only serves man for light, but is useful to him for many other purposes.

Whether that oil was produced from animal or vegetable substances, appears, even now, a matter of dispute. Some naturalists suppose that vast numbers of oil-giving creatures had been assembled in the districts in which these oil wells are now found, and the oil was pressed out of them by a superincumbent weight of rock. Others assert that the same

result might be produced from a vast mass of oil-giving vegetation having been crushed by a similar process. Be that as it may, in several parts of the States, as well as in Canada, enormous pits exist full of this curious oil. It is obtained by boring in the ground in those spots where the oil is likely to be found. Often, however, the speculator, after spending time and capital in the experiment, finds that no oil appears at his call.

In some spots, where it was first discovered, after the boring was completed, some hundreds of tons flowed up so rapidly, that it was difficult to find casks sufficient to preserve the produce. The whole region round is impregnated with the odour of the oil. Long teams of waggons come laden with casks of oil on the roads approaching the wells. Sheds for repairing the casks, and storing the oil, are ranged around. Every one gives indubitable signs by their appearance of their occupation, while rock-oil, as it is called, is the only subject of conversation in the neighbourhood.

Mammoth Trees and Caverns of Calaveras.

Gigantic as are the trees found in many of the eastern forests of America, they are far surpassed by groves of pines discovered a few years back in the southern parts of California. They are found in small groves together—in some places only three or four of the more gigantic in size; in others, as many as thirty or forty, one vying with the other in height and girth. In one grove, upwards of one hundred trees were found, of great size, twenty of which were about seventy-five feet in circumference. One of these trees, of greater size than its companions, was sacrilegiously cut down. Its height was 302 feet, and its circumference, at the ground, 96 feet. As it was impossible to cut it down, it was bored off with pump-augers. This work employed five men for twenty-two days. Even, after the stem was fairly severed from the stump, the uprightness of the tree and breadth of its base sustained it in its position, and two days were employed in inserting wedges and driving them in; but at length the noble monarch of the forest was forced to tremble, and then to fall, after braving the battle and the breeze for nearly three thousand winters.

Many of the trees have received appropriate names. One has fallen, and has been hollowed out by fire. Through it a person can ride on horseback for sixty feet. Its estimated height, when standing, was 330 feet, and its circumference, 97 feet. Another of these giants is known as Hercules. It is 320 feet high, and 95 feet in circumference. Perhaps the most beautiful group is that

of three trees known as the Three Graces. Each of them measures 92 feet in circumference at the base; and in height they are nearly equal, measuring 295 feet. Time was when, perhaps, the whole forest consisted of trees of the same size; but many have been destroyed by fire, and the time may come when none of those now standing will remain. The name of Wellingtonia has been given to the species.

In the same region are numerous magnificent stalactite caverns, which equal in beauty, if not in size, those of the Mammoth Cave of Kentucky.

There are several waterfalls, unsurpassed for picturesque beauty.

Had we time, we might pay a visit also to the gold-mines of California, and observe the way they are worked; but we should be prevented from giving that attention to the animal creation which is our present object.

Part 1—Chapter IV.

General Survey of the Zoology of North America.

Having thus obtained a bird's-eye view of the physical features of North America, we will take a rapid survey of its zoology before we more minutely inspect the individuals of which it consists.

In a region of extent so vast as the continent of America, reaching from the Arctic Circle at one end far-away towards the Antarctic Ocean at the other—with dense forests, under a tropical sun, in some parts; open plains, lofty mountains, or a network of rivers and streams, vast lakes and marshes, in others—we shall find all varieties of form in the animal kingdom. This gives to its study an especial interest. While the larger number of its members are especially local, confined in narrow spaces between two streams, others range beyond 50 degrees and 60 degrees of latitude. The puma wanders across the plains of Patagonia, and ravages the flocks of the settlers on the western prairies of the United States. The reindeer feeds on the moss-covered moors of the Arctic islands, and is chased by the hunters far south among the defiles of the Rocky Mountains. Vast herds of bison darken the plains of New Mexico, and reach the upper waters of the Saskatchewan. The same wild fowl

which hatch their young among the ice-surrounded cliffs of Northern Greenland are found sporting in the lakes of Central America; while some of the smallest of the feathered tribes, the gem-like humming-birds, have been seen flitting through the damp mists of Tierra del Fuego, sipping the sweets of Alpine flowers high up amid lofty peaks of the Andes, and appearing on the hill-sides in sight of Lake Winnipeg, on the north of Rupert's Land.

However, as we proceed in our survey, we shall be able to note such, and many other interesting facts connected with the zoology of the districts we visit.

We shall find in the northern portion of the continent, extending nearly as far south as the sixtieth degree of latitude, and even beyond that parallel, several animals which are identical with those inhabiting the same latitudes in Europe and Asia. The Polar or white bear, the sovereign of the Arctic world, ranges entirely round the Circle; and makes his way across the icy seas over the rugged snow-clothed rocks, so that he belongs as much to Europe and Asia as to America. The cunning wolverene, the ermine, the pine-marten, the Arctic fox and common weasel, also inhabit the same latitudes of the three continents. Among the herbivorous quadrupeds, there are several which have made their way across the frozen ocean. The American elk, though called the moose, is identical with the same animal found in Asia and Europe; so is the reindeer, known here as the cariboo. Both, indeed, are Arctic animals, though they migrate to southern latitudes when the severer cold and depth of snow prevents them from obtaining the moss and lichens on which they feed. The little Polar hare ranges round the Arctic Circle; but there is one animal, the musk-ox, which, being truly an Arctic quadruped, is unknown either in Asia or Europe, and therefore belongs exclusively to America.

Of the feathered tribes, the larger number of individuals, as might be supposed, are common to the northern portions of the three continents. Among these are the golden eagle, the white-headed or sea eagle, the osprey, the peregrine falcon, the gyrfalcon, the merlin goshawk, the common buzzard, rough-legged buzzard, hen-harrier, long-eared owl, short-eared owl, great snowy owl, and Tengmalm's owl. Nearly all the ducks and other swimming families, as might be expected, are also identical, as they can make their way with ease round the Circle, and find the same food and conditions of life. The waders, however, are generally distinct from those of Europe,

as are the grouse inhabiting the same parallels of latitude. Only one or two have been found in Europe, as well as in America.

We must now take a glance at the animals which are distinctly American. In the first place, there are three bears—the savage grizzly of the Rocky Mountains; the cunning black bear; and the bear of the Barren Grounds. The beaver might take the first rank among American animals, for his sagacity, if not for his size. Then comes the Canada otter; the vison or minx; the clever little tree-loving raccoon; the American badger, differing from his European relative; and the pekan. There are several varieties of wolves, differing in size and somewhat in habits, but all equally voracious. There are several species of foxes, and no less than thirty of lemmings, marmots, and squirrels, all of which are to be found within the more northern latitudes of the New World. There are three hares—known as the American, the prairie, and the little chief hares—which range over the northern continent. Of the large animals we have the wapiti, a species of deer; two species of the black-tailed deer; a long-tailed deer; and the prong-horned antelope; also the wild goat; the bighorn sheep of the Rocky Mountains; and last, though not least, the American bison, familiarly known as the buffalo—the inhabitant of the wide-spreading plains and prairies extending from the Arctic Circle to Mexico.

Among the land birds, especially the birds of prey, there are several which are spread over the greater part of the northern continent, some indeed being found also in great numbers in South America. These are the turkey vulture, the black vulture, the little rusty-crowned falcon, the pigeon hawk, slate-coloured hawk, red-tailed buzzard, American horned owl, little American owl, and five other species of falcons. The perchers are less widely distributed.

There are, however, numerous families of insectivorous birds peculiar to America, which either permanently inhabit the more genial portions of the continent, or pay annual visits to those regions where the richest fruits abound and insect life prevails, affording them an abundant banquet. These migrating birds, as the winter draws on, take their departure southward to the warmer climate of Mexico, where they find abundance of food. As the summer returns, and the fruits of the orchard, the corn of the field, and wild berries ripen, and insects increase in numbers, vast flocks of warblers, woodpeckers, maize-birds, fly-catchers, thrushes, hang-nests, pigeons, blue-birds, and others return from their southern pilgrimage, to feed on the minute creatures which now people the plains, the hill-sides and

forests, and on the abundant productions of the earth, enlivening the forests with their varied plumage, and delighting man by their melodious notes.

The number of gallinaceous birds is extremely limited. America can, however, boast of its native wild turkey—one of the most magnificent game-birds in existence. There is also the pinnated or Cupid Grouse. The Barren Grounds of Kentucky, and a few other districts, are inhabited by the ruffle grouse, which is also often called the pheasant. It ranges to a considerable distance northward, and Dr Richardson found it even on the borders of the Polar regions. There is likewise a small-sized partridge, which is improperly called the quail.

With the exception of the golden plover, few of the wading birds resemble those of Europe. The snipe, the woodcock, the curlew, most of the sandpipers, together with the coot and the water-hen, are distinct from those of Europe, and are not only peculiar to America, but few of them have been found to the south of the line. One of the most magnificent birds is the American flamingo, which is of a more beautiful and intense scarlet than that of Europe, and fully as tall; another bird, the wood-ibis, has the same form as the glossy ibis of southern Europe. In Carolina and Florida is found the magnificent scarlet ibis, but it seldom makes its way to the northern parts of the Union. There are several large and beautiful species of herons. Although most of the duck tribe range throughout the continent, there are some—such as the summer or tree duck of South Carolina—which range from the States to the warmer shores of the southern provinces, while the celebrated canvas-back duck, so highly prized at table, is found chiefly in the temperate parts of the continent. The rest of the duck tribe inhabit the northern regions, only quitting them for the United States during the severity of winter.

Part 1—Chapter V.

Description of Various Animals—Ruminants.

The Moose, or Elk.

We shall not introduce the animals we are about to inspect according to a systematic classification, but bring them forward as they appear to the eye of the traveller or sportsman, giving the largest and the most important the first place. Our object is

rather to view the characteristic animals of each region we visit than to attempt a scientific examination of the whole animated kingdom of the world—a task which must be left to those who have far more time at their disposal than we possess.

We will begin, therefore, with the animals belonging to the ruminantia—the eighth in natural order; taking next the carnivora—the fifth; and the smaller rodentia—the sixth; while the birds and reptiles will follow in due course. Among these, however, we shall select only the most notable and curious; for although North America does not teem with animal life in the same degree as the southern half of the continent, were we to attempt to introduce all those existing in it we could give but a meagre account of each.

Without further preface, therefore, we will commence our survey with the elk.

The monarch of the American pine-forests—the superb moose or elk—ranges from the mouth of the Mackenzie River to the shores of the Atlantic, at the eastern extremity of Nova Scotia, and passing the great lake region, is found even as far as the State of New York. Observe him as he stands with huge palmated horns ready for action, his vast nostrils snuffing up the scent coming from afar; his eyes dilated, and ears moving, watching for a foe; his bristly mane erect; his large body supported on his somewhat thick but agile limbs, standing fully six feet six inches in height at the shoulder, above which rise the head and antlers. The creature's muzzle is very broad, protruding, and covered with hair, except a small moist, naked spot in front of the nostrils. He has a short, thick neck, the hair thick and brittle. The throat is somewhat maned in both sexes. So large is the cavity of the nose, that a man may thrust his arm right into it. The inter-maxillaries are very long, and the nasals short. He differs from the European elk only by having much darker hair,—the coat of the male, when in its prime, at the close of the summer, being completely black. Under the throat the males have a fleshy appendage termed the bell, from which grow long black hairs. The bristles on his thick muzzle are of a lighter colour than those of the coat, being somewhat of a reddish hue. The neck and shoulders are covered with very fine soft wool, curiously interwoven with the hair. Out of this the Indians manufacture soft, warm gloves. The moose hair is very brittle and inelastic. It is dyed by the Indians, and employed for ornamenting numerous articles of birch-bark. The moose is of cautious and retiring habits, generally taking up his abode amid the mossy swamps found round the margins of the lakes, and

which occupy the low ground in every direction. Here the cinnamon fern grows luxuriantly, while a few swamp maple saplings and mountain ash trees occur at intervals, and afford sufficient food to the moose.

It is to these regions the bull retires with his consort, and remains for weeks together, claiming to be the monarch of the swamp; and should he hear the approach of a distant rival, he will crash with his antlers against the tree stems, making sudden mad rushes through the bushes, the sound of his blows reverberating to a distance. He has also a curious custom of tearing up the moss over a considerable area, exposing the black mud by pawing with the fore-feet. He continually visits these hills, and in consequence a strong musky effluvia arises from them. The Indian hunter, by examining them, can ascertain without fail when they were last visited by the animal. He utters loud sounds both by day and night, described by the Indians in their guttural voices as "quoth, quoth," but occasionally becoming sharper and more like a bellow when he hears a distant cow. The cow utters a prolonged and strangely wild call. This is imitated by the Indian hunter through a trumpet composed of rolled-up birch-bark, when his dogs are in chase of the animal; and the bull being by this means attracted towards him, becomes more easily his victim.

During the early part of the year, and the summer, the antlers are growing; but this process ceases early in September, when the moose has got rid of the last ragged strip of the deciduous skin against the young larch-trees and alder-bushes. He now stands ready to assert his claims against all rivals. At this season the bulls fight desperately; often the collision of the antlers of huge rivals, driven with mighty force by their immense and compact necks, is heard to a great distance, like the report of a gun on a still autumnal evening. They probably approach from different directions, regardless of the rugged ground, the rocks, and fallen trees in their course, bellowing loudly, and tearing up the ground with their horns. Now they catch sight of each other, and rush together like two gladiators. Now butting for some time till their antlers become interlocked, perhaps both fall struggling to the ground. Frequently portions of skeletons, the skulls united by firmly-locked antlers, have been found in some wilderness arena, where a deadly fight has occurred. A magnificent pair of horns thus interlocked is to be seen in the Museum of the Royal College of Surgeons. Terrible must have been the fate of the combatants, illustrating Byron's lines:—

"Friends meet to part;
Love laughs at faith:
True foes once met,
Are joined till death."

Captain Hardy says he has twice heard the strange sound emitted by the moose, which, till he became acquainted with its origin, was almost appalling. It is a deep, hoarse, and prolonged bellow, more resembling a feline than a bovine roar. Sometimes the ear of the hunter is assailed by a tremendous clatter from some distant swamp or burned wood. It is the moose, defiantly sweeping the forest of pines right and left among the brittle branches of the ram pikes, as the scaled pines hardened by fire are locally termed. When, however, the moose wishes to beat a retreat in silence, his suspicions being aroused, he effects the process with marvellous stealth. Not a branch is heard to snap, and the horns are so carefully carried through the densest thickets, that a rabbit would make as much noise when alarmed. He will also, when hard-pressed, take the most desperate leaps to avoid his foes.

Though he seldom or never attacks human beings when unassailed, he will do so occasionally when badly wounded, if nearly approached. An old Indian hunter had one day followed up a moose, and wounded the animal, when it turned on him. There being no tree near, he jammed himself for safety between two large granite boulders which were at hand. The aperture, however, did not extend far enough back to enable him to get altogether out of the reach of the infuriated bull, which set on him with its fore-feet, and pounded him so severely that several of his ribs were broken; indeed, for several years afterwards he was nearly bent double by the severe beating he had received.

In the summer, when the plague of flies commences, the moose takes to the water to avoid their bites. There are several species—one termed the moose-fly—which are equally annoying to the hunter. The animal strives to free himself from their irritation by running among bushes and brambles; and should he reach a lake, he will plunge into the water, allowing only his nostrils and mouth to remain above the surface. Sometimes, indeed, he will dive altogether, and is frequently known to hide himself from his pursuers by remaining for a long time below the water. He also feeds upon the tendrils and shoots of the yellow pond-lily, by reaching for them under water. An Indian, on one occasion, was following the track of a moose, when it led him to the edge of a little round pond in the woods, whence he

could find no exit of the trail. After waiting for some time, he beheld the head of the animal rising above the surface in the very middle of the pond. While hastening for his gun, which he had left at a little distance, the moose made for the opposite shore, and emerging from the water, regained the shelter of the forest ere he could get round for a shot. The animals have been known also to visit the seashore, and one was seen swimming off to an island over a mile distant, which he reached in safety.

The moose feeds chiefly on the leaves of young shoots and bushes, or the smaller trees—the red and other maples, the white birch, the balsam, fir, poplar, and mountain ash; and occasionally, as has been said, on the roots of the yellow pond-lily, with a bite now and then at a tussock of broad-leaved grass growing in the dried bogs. To get at the foliage beyond the reach of his muzzle, he frequently charges a young tree and rides it down, till he has brought the tempting leaves within his reach.

The horns of the animal begin to sprout in April, the old pair having fallen some time before. In the middle of this month the coat is shed, when the animal for some time afterwards presents a very rugged appearance. The cow towards the end of May produces one or two calves, generally near the margin of a lake, or in one of the densely-wooded islands, where they are secure from the attacks of the bull moose, who, cruel tyrant that he is, often destroys them. Rarely more than two are born at a time.

Besides its human foes, the moose is attacked occasionally by the bear. Captain Hardy describes coming upon the traces of a recent struggle between a young moose and one of these animals. "The bear had evidently stolen through the long grass upon the moose, and had taken him at a disadvantage in the treacherous bog. The grass was very much beaten down, and deep furrows in the soil below showed how energetically the unfortunate moose had striven to escape from his powerful assailant. There was a broad track plentifully strewn with moose hair, showing how the moose had struggled with the bear, to the wood, where, no doubt, the affair ended, and the bear dined."

As the winter approaches, the cows, with the young bulls and calves, congregate in small parties on the open "barrens" and hill-sides. When the snow comes thickly down, they form what is called a yard; and in Canada, where its depth is very great, they have to remain in it during the whole winter, feeding round the area on the young wood of deciduous trees. In Nova Scotia,

however, they migrate to other localities when they have consumed the more tempting portions of food in the yard. In the morning and afternoon they are found feeding, or chewing the cud; but at noon, when they lie down, they are difficult to approach, as they are then on the alert, employing their wonderful faculties of scent and hearing to detect the faintest taint or sound in the air, which might indicate the approach of danger. The snapping of a little twig, the least collision of a rifle with a branch, or crunching of the snow under the mocassins, will suffice to arouse them. Curiously enough, however, they are not alarmed by any sound, even the loudest, to which they have been accustomed. The hunter has, therefore, to approach the yard with the greatest possible caution, in order to get a shot.

We will, however, start off on a moose hunt, in autumn, with a practical Indian hunter. The air of the autumnal night is frosty and bracing. The moose are moving rapidly from place to place. Night is drawing on. The last fluttering of the aspens dying away, leaves that perfect repose in the air which is so necessary to the sport. The moon rises, shedding a broad and silvery light through the forest. Mysterious sounds greet our ears. The Indian hunter is provided with his trumpet of birch-bark, in the form of a cone, about two feet in length. He shelters himself behind the edge of the banks, a clump of bushes, or rocks; and now he emits the cry of the cow moose, so exactly, that the male animal is easily deceived by it. He waits: there is no response. An interval of fifteen minutes elapses; still no reply is heard. Again the Indian sends his wild cry pealing through the wood. Presently a low grunt, quickly repeated, comes from some distant hill; and the snapping of branches and falling trees attests the approach of the bull. The hunter is now doubly careful; kneeling down, and thrusting the mouth of his call into some bushes close by, he utters a lower and more plaintive sound. At length an answer reaches his ears. The snapping of the branches is resumed; and presently the moose is seen stalking into the middle of the moonlit "barren." Our weapons are ready; and as the magnificent animal stands looking eagerly around in the woodland amphitheatre, a rifle ball, laden with death, brings him to the ground.

In some districts the Indians employ another method of calling. They conceal themselves in a swamp, in the midst of some damp mossy valley, during a dark night. One holds a torch of birch-bark with a match ready for lighting. The hunter calls, and the moose approaches more readily than towards the open "barren." When the creature is within distance of the deadly

rifle, the match is applied to the torch, which, flaring up, illuminates the swamp, and discovers the startled moose standing amidst the trees, and incapable apparently of flight. The Indians declare that he is fascinated by the light; and though he may walk round and round it, he will not leave the spot, and thus presents an easy mark to the hunter's rifle.

Let us set forth on an expedition to "creep" moose, which may be described as a similar mode of hunting to stalking. The ground we select is among the "barrens" before described. It is strewn with dead trees in all directions, amid which briars and bushes have grown up, and conceal their sharp, broken limbs, and the rough granite rocks scattered in all directions. Here, collecting wood for burning, we form our camp, and sit round the blazing fire, on which a well-filled frying-pan is hissing, while we are covered by our blankets to protect ourselves from the pattering rain-drops. Our suppers over, we stretch ourselves for repose, and gradually fall asleep, as the snapping of the logs on the fire, the pattering of the rain, and the hootings of the owls in the distant forest become less and less distinct. Our Indian brings us notice in the morning that two moose have passed close to the camp during the night. However, in spite of the plaintive call from the treacherous bark trumpet, they will not approach, having been forewarned of danger by the smell of our camp-fire. We make our way amid the bushes, already leafless, except that here and there are seen bunches of dwarf maples with a few scarlet leaves of autumn still clinging to them. Presently our companion whispers, "Down—sink down! slow—like me!" A magnificent bull appears about five hundred yards off. The wind is blowing from him to us. The Indian utters the usual call; but the moose does not answer, having already a companion close at hand. Presently he lies down in the bushes, and we worm ourselves slowly and laboriously towards the edge of the alder swamp. Gently lowering ourselves into the swamp, we creep noiselessly through the dense bushes, their thick foliage closing over our heads. It is an anxious moment!—the slightest snapping of a bough, the knocking of a gun-barrel against a stem, and the game is off. "We must go back," whispers the Indian. "Cannot get near enough on this side. Too open!" The difficult task of retreating is performed without disturbing the moose. Another half-hour is then employed in creeping like snakes through the wet bushes. At length, as we reach the edge of the swamp, the great animal rises directly facing us, gazing steadily towards us. We fire. A headlong stagger follows the report; and the creature, turning round, is hidden from sight behind a clump of bushes. The Indian at the same time fires at a large cow moose who has, unknown to us,

been lying close to the bull. We dash forward a few paces. On the other side the great bull suddenly rises in front of us and strides on into thicker covert. Another shot, and he sinks lifeless at our feet.

The Cariboo, or Reindeer.

We have before mentioned the extensive tracts existing in North America, which, from their desolate appearance, are appropriately called "Barrens." Far as the eye can reach the whole ground is seen strewn with boulders of rock and fallen trees, scattered round in the wildest confusion. Here and there charred stumps rise from the green-sward; in some spots clumps of spruce are seen, against which the white stems of the graceful birch stand out in bold relief; while the bank of some stream, or the margin of a lake, is marked by fringing thickets of alder. In many parts are moist, swampy bogs, into which the sportsman sinks ankle-deep at every step. The ground, however, is everywhere thickly carpeted by a luxuriant growth of a species of lichen. It possesses wonderfully nutritive qualities; so much so, that large quantities of alcohol have lately been extracted from it, as well as from other lichens growing in sub-arctic regions. It is the chief food of the cariboo, which animal frequents these desolate-looking "barrens."

Visiting one of these "barrens," we may perchance fall in with several of the noble-looking animals known in Europe and Asia as the reindeer, though we must look sharp to recognise them; for so similar are they in colour to the rocks and general features of the ground, that only the keen eye of the Indian can easily detect them, especially when they are lying down. Should we approach them on the weather-side, or should the slightest noise be made, they will quickly detect us. Up they spring, and after a brief stare, make off in graceful bounds at a rapid rate. Now, having got beyond danger, they drop into a long swinging trot, and proceed in single file across the "barren," till they enter the line of forest in the far distance.

The cariboo of North America is a strongly-built, thickset animal, compared to the more graceful of his relatives. He carries on his head a pair of magnificent antlers, varying greatly in different specimens—some palming towards the upper ends, others with branches springing from the palmed portions. In most instances there is but one developed brow antler, the other being a solitary curved prong. The back of the cariboo is covered with brownish hair, the tips of which are of a rich dun grey, whiter on the neck than elsewhere. The nose, ears, and outer surface of the legs and shoulders are of a brown

hue. The neck and throat are covered with long, dullish white hair, and there is a faint whitish patch on the side of the shoulders. The rump and tail are snowy-white, while a band of white runs round all the legs, joining the hoofs.

As winter approaches, the hair grows long, and lightens considerably in hue. Frequently, indeed, individuals may be seen in a herd with coats of the palest fawn colour—almost white. The muzzle is entirely covered with hair. The fur is brittle, and though in summer it is short, in winter it is longer and whiter, especially about the throat. The hoofs are broad, depressed, and bent in at the tip. The full-grown bucks shed their horns, and it is seldom that they are seen in a herd after Christmas. The female reindeer, however, retains hers during winter. Several theories have been advanced to account for this. There seems no doubt, however, that the object is to enable the female to protect her fawns from the males, who are apt to attack the young and destroy them.

The cariboo is gregarious, and males, females, and young herd together at all seasons; and by this provision of Nature the females are able to defend the young, who would otherwise be subjected to injury. In another respect these animals are wonderfully provided for the mode of existence they are compelled to pursue. Not only have they to cross wide snow-covered districts, but frequently to pass across frozen expanses of water. To enable them to do this in the winter, the frog of the foot is almost entirely absorbed, and the edges of the hoof, now quite concave, grow out in sharp ridges, each division on the under surface presenting the appearance of a huge mussel-shell, and serving the office of natural skates. So rapidly does the shell increase, that the frog does not fill up again till spring, when the antlers bud out. With this singular conformation of the foot, it has a lateral spread; and an additional assistance for maintaining a foothold on slippery surfaces is given by numerous long, stiff bristles which grow downward at the fetlock, curving over entirely between the divisions. The cariboo is thus enabled to proceed over the snow, to cross frozen lakes, or ascend icy precipices, with an ease which places him, when in flight, beyond the reach of all enemies, except perhaps the nimble and untiring wolf.

The cariboo is essentially a migratory animal. There are two well-defined periods of migration, in the spring and autumn. Throughout the winter it appears also seized with an unconquerable desire to change its residence. One day it may be found feeding quietly through the forests in little bands, and

the next, perhaps, all tracks show a general move in a certain direction. The animals join the main herd after a while, and entirely leaving the district, travel toward new feeding-grounds. Though often found in the same woodlands as the moose, they do not enjoy each other's company. In severe winters the caribos travel to the southernmost limits of their haunts, and even sometimes enter the settlements. Not being aquatic, like the moose, to avoid the flies in summer they ascend the mountain ranges, where they can be free from their attacks. The hunter, however, follows them, and their speed being of no avail among the precipices, many are shot. During most of the year the flesh of the animal is dry and tasteless; but it possesses a layer of fat, two or more inches thick, which is greatly esteemed. This, with the marrow, is pounded together with the dried flesh, and makes the best kind of pemmican—a food of the greatest value to the hunter. The cariboo lives in herds, sometimes only of ten or twenty, but at others consisting of thirty or more individuals. They range across the whole width of the continent, being found in great numbers to the west of the Rocky Mountains, especially at the northern end of British Columbia. Although specifically identical with the reindeer of Europe, it has never yet been trained by Indians or Esquimaux to carry their goods or draw their sleighs, as in Lapland and along the Arctic shores of Asia.

The Wapiti, or Canadian Stag.

In the wilder parts of the Southern States of the Union, herds of the magnificent Canadian stag or wapiti—popularly called the elk—range amid the woods and over the prairies. Sometimes three or four hundred are found in one herd, always led by an old buck, who exacts from them the strictest obedience—compelling them to halt or move onward as he judges necessary. Now the superb herd of long-horned creatures are seen to wheel to the right or left, now to advance or retreat at the signal he issues.

The wapiti is indeed a grand animal, growing to the height of the tallest ox, and endowed with wonderful activity, as well as power. See him as he dashes through the forest, his branched horns separating in serpentine curves, six feet from tip to tip, laid close over his back as he makes his way amid the trees. His head is of a lively, yellowish-brown hue, the neck covered with reddish and black hairs, the latter of considerable length, descending in a thick bunch below it. They are among the fiercest of the deer tribe. The bucks often enter into desperate contests with each other, battling—with their huge horns—the

fight frequently ending only with the death of the weaker rival. Sometimes their horns have become so inextricably interlocked, that both have fallen to the ground, and, unable to rise, have perished miserably. They will frequently, when wounded, attack their human assailants; and the bold hunter, if thus exposed with rifle unloaded to their fierce assaults, will rue the day his weapon failed to kill the enraged quarry at the first shot.

The wapiti, when pursued, will boldly plunge into the lake or broad river, and breast the rapid current to avoid his foes; or will occasionally, if hard-pressed, attack the bold hunter who ventures to follow in his light canoe.

His cry is a sharp whistling sound, which rings through the air far and wide on a calm day. He feeds on the branches of the trees and grass, and in winter scrapes, with his powerful fore-feet, deep into the snow, to obtain the lichens and dry herbage which grow beneath. His flesh for several months in the year is dry and coarse, but his hide is much prized by the Indians, who manufacture from it a leather of a peculiarly soft character, which retains that quality after being wet,—instead of turning hard, as is the case with that manufactured from other deerskins. A remarkable feature of the wapiti is that the horns differ in form almost as greatly as do those of the branches of trees, no two specimens being found with them exactly alike.

The Karjacou, or Virginian Deer.

The most graceful of the deer tribe, the karjacou, scours in large herds across the prairies, frequently entering the haunts of man. Yet so easily is it scared that it takes to flight at the very appearance of a human being. Curiously enough, however, it will again return to its favourite feeding-grounds, even though the hunter's rifle may lay low many of the herd. It is about the size of the fallow-deer, and of a light brown hue. Its horns are slender, and have numerous branches on the interior sides, but are destitute of brow antlers.

Let us watch a herd startled by our approach. Away they spring, leaping into the air, turning their heads in every direction to ascertain the cause of their alarm, and then rush off at full speed; but in a short time, if they are not followed, we may see them return, especially as night draws on, and crouch down in their accustomed sleeping-places. Should a salt lake be near, they will come in vast numbers to lick up with their tongues the saline particles adhering to the surrounding stones, where the salt has crystallised from the evaporation of the water.

They are at all times thirsty, and they require constant draughts of pure water, to obtain which they are sure to visit the nearest stream or spring as night is about to close over the scene. Wherever the tenderest herbage grows upon the plain, there the karjacou comes to crop it during summer. In winter he finds an abundant supply of food from the buds and berries, or fallen fruits; or, when snow is on the ground, he eats the string moss hanging in masses from the trees. He willingly takes to the water, and will cross a lake or broad river, swimming at a rapid rate with his whole body submerged, his head alone appearing above the surface; thus he will often baffle his pursuers, even though they may follow him with a boat. He has been known, indeed, when hard-pressed near the sea-coast, to plunge into the ocean, and buffeting the waves, to make his way far from the land, rather than be captured.

His flesh affords the Indian a large portion of his winter supply of food, while his skin is manufactured into clothing, the leather from it being especially soft and pliable. From the settlers in the western provinces he receives little mercy, as, without hesitation, he leaps their fences, banqueting on their growing corn or vegetables; and, after doing all the mischief in his power, by his activity generally again makes his escape. No animal surpasses in beauty the young fawn, the fur of which is of a ruddy brown tint, ornamented with white spots arranged in irregular lines, merging occasionally into wide stripes.

Like others of his tribe, the male is excessively combative when meeting others of his own species; and a story is told of three animals thus encountering each other in a desert, when all their horns becoming entangled, they remained fixed, unable to separate, till they sank together on the ground, their skulls and skeletons afterwards being discovered, thus giving evidence of the combat and its fatal result.

The Antelope.

No animal of the American wilds surpasses the antelope in beauty. The little creatures congregate in herds of many thousands, though, from the exterminating war waged against them by the Indians, they have greatly decreased in numbers. The size of the antelope is about that of the common red-deer doe; the colour somewhat between buff and fawn, shaded here and there into reddish-brown, and a patch of pure white on the hind-quarters. This gives rise to the expression of the hunter, when he sees it flying before him, that the creature is "showing its clean linen." The ears are placed far back on the head, are very long, and curved so much that at a distance they appear

like horns, while the horns themselves appear as if coming out of the animal's eyes; they are long and slender, curving slightly backwards, and have no branches, except a little bud, which is developed when the creature is about two years old. The chief peculiarity of the animal is its lack of a dewlap.

The feet have no rudimentary hoofs like the deer, yet this want in no way interferes with its speed. Often the creature may be seen for a moment browsing not fifty yards off, the next it has dwindled to a mere speck, and is in another lost to sight. They do not leap like deer, but run with level backs, as sheep do, their legs glancing faster than sight can follow. In vain the hunter attempts to follow the rapid movements of the creatures on horseback. Perhaps they will let him approach to within a short distance, and then away they float on a line at right-angles to their former retreat. To come up with them, indeed, as an American writer observes, is as hopeful an undertaking as trying to run down a telegraphic message. The only way to get near them is by a stratagem. They are not afraid of horses, and the hunter, by walking behind his horse, may often approach a herd without being discovered, provided the wind blows from them. He then pickets his horse with a sharp stake, and sinking down in the grass he ties a bright-coloured handkerchief to the end of his ramrod; he then crawls forward on hands and knees, dragging his rifle, till he approaches still nearer, when he remains concealed, and lifts his flag in the air. The antelopes, on catching sight of it, stop browsing, and raising their heads, peer towards it, exhibiting no signs of fear. For a moment he drops his flag; the beautiful creatures then resume their repast, but their curiosity gets the better of their prudence. Again they look forward, when the flag is once more raised and waved slowly backward and forward. The antelopes have now their curiosity excited to the utmost; for a moment they stop irresolute, then advance a few steps snuffing the air. Once more the flag sinks out of sight; they seem to be asking each other what is the cause of the strange sight they have seen. Again it is raised; they draw nearer and nearer, till they are within range of the hunter's deadly rifle; he fires, and almost to a certainty one of the beautiful animals springs into the air and tumbles head-foremost on the ground. For a moment the survivors run off from their fallen friend, but seldom go far. Once more they return within easy rifle-shot of the hunter. Unless, however, he requires the meat, he must be greatly lacking in right feeling if he slaughters uselessly so beautiful an animal. The antelope becomes so easily confused, that when met on the prairies it frequently runs headlong into the midst of the travellers. The creatures are often killed by being surrounded, when the whole

herd are driven into an enclosed spot and become the easy prey of the hungry hunters.

The Bighorn, or Mountain Sheep.

Amid the almost inaccessible peaks of the Rocky Mountains, herds of animals with enormous horns may be seen leaping from rock to rock, sometimes descending at one spring from a height of twenty or thirty feet—when, the Indians assert, they invariably alight on their horns, and by this means save their bones from certain dislocation. They are bighorns, or mountain sheep, and are considered the chief game of these regions. The animals appear to partake both of the nature of the deer and of the goat. They resemble the latter more especially in their habits, and in frequenting the most lofty and inaccessible regions, whence, except in the severest weather, they seldom descend to the upland valleys. In size the bighorn is between the domestic sheep and the common red-deer of America, but is more strongly built than the latter. It is of a brownish-dun colour, with a somewhat white streak on the hind-quarters. The tail is shorter than that of the deer, and tipped with black. As the age of the animal increases, the coat becomes of a darker tinge. The horns, of the male especially, are of great size, curving backwards about three feet in length, and twenty inches in circumference at the roots.

Frequently on the highest spot one of the band is stationed as a sentinel, and whilst the others are feeding he looks out for the approach of danger. They have even more acute sight and smell than the deer. On an alarm being given the whole herd scampers up the mountain, higher and higher, every now and then halting on some overhanging crag and looking down oh the object which may have caused them alarm; then once more they pursue their ascent, and as they bound up the steep sides of the mountains throw down an avalanche of rocks and stones.

Occasionally the young lambs are caught and domesticated by the hunters in their mountain homes, when they become greatly attached to their masters, amusing them by their merry gambols and playful tricks. Attempts have been made to transport them to the States; but although milch-goats have been brought to feed the lambs, they have suffered by the change from the pure air of the mountains to the plains, or they have not taken kindly to their foster-mothers, and have invariably perished on the journey.

The creatures reach a height of three feet six inches at the shoulders, while the horns are of about the same length. In

colour they vary greatly, changing according to the season of the year.

The Bison, commonly called the Buffalo in America.

Throughout the wide-extending prairies of North America, from north to south to the east of the Rocky Mountains, vast herds of huge animals—with shaggy coats and manes which hang down over the head and shoulders reaching to the ground, and short curling horns, giving their countenances a ferocious aspect—range up and down, sometimes amounting to ten thousand head in one herd. They commonly go by the name of buffaloes, but are properly called bisons. Clothed in a dense coat of long woolly hair, the buffalo is well constituted to stand the heats of summer as well as the cold of the snowy plains in the northern regions to which he extends his wanderings.

Let us look at him as he stands facing us on his native plains, his red eyes glowing like coals of fire from amid the mass of dark brown or black hair which hangs over his head and neck and the whole fore part of his body. A beard descends from the lower jaw to the knee; another huge bunch of matted hair rises from the top of his head, almost concealing his thick, short, pointed horns standing wide apart from each other. As he turns round we shall see that a large oblong hump rises on his back, diminishing in height towards the tail: that member is short, with a tuft of hair at the tip. The hinder part of the body is clothed with hair of more moderate length, especially in summer, when it becomes fine and smooth, and soft as velvet. From his awkward, heavy appearance, when seen at a distance, it would not be supposed that he is extremely active, capable of moving at a rapid rate, and of continuing his headlong career for an immense distance. So sure of foot is he, also, that he will pass over ground where no horse could follow, his limbs being in reality slender, and his body far more finely proportioned than would be supposed till it is seen stripped of its thick coating of hair. While his thick coat protects him from the cold, he is also provided with a broad, strong, and tough nose, with which he can shovel away the snow and lay bare the grass on which he feeds. Sometimes, however, when a slight thaw has occurred, and a thin cake of ice has been formed over the snow, his nose gets sadly cut, and is often seen bleeding from the effects of his labours. It is said that when a herd comes near the settlements, the domesticated calves, and even the horses, will follow the buffalo tracks, and graze on the herbage which they have disclosed and left unconsumed.

The flesh of the buffalo, especially that of the cow, is juicy, and tender in the extreme. The most esteemed portion is that composing the hump on its back, which gives it so strange an aspect. It is indeed frequently killed merely for the sake of this hump, and the tongue and marrow-bones. Sometimes, also, when parched with thirst, the hunter kills a buffalo to obtain the water contained within certain honeycombed cells in its stomach. The buffalo is provided with this reservoir, in which a large quantity of pure water can be stored, that it may traverse, without the necessity of drinking, the wide barren plains where none can be obtained. Vast numbers, without even these objects in view, are wantonly slaughtered, and the chief part of the flesh utterly wasted, by the thoughtless Indians of the plain, who have thereby deprived themselves of their future support. Many tribes depend almost entirely for their subsistence on the buffalo, of which the flesh is prepared in several ways. When cut up into long strips, and dried in the sun till it becomes black and hard, it will keep for a long time. It is also pounded with the fat of the animal, and converted into *pemmican*—an especially nutritious food, which, if kept dry, will continue in good order for several years.

The prairie Indians make use of the hide for many purposes. They scrape off the hair and tan it, when it serves them for coverings for their tents. It is also carefully dressed, when it becomes soft and impervious to water. It is then used for clothing. Some of the tribes also form their shields from it. The hide is pegged down on the ground, when it is covered with a kind of glue. In this state it greatly shrinks and thickens, and becomes sufficiently hard to resist an arrow, and even to turn aside an ordinary bullet which does not strike directly.

The buffalo is especially a gregarious animal, and is found in herds of immense size, many thousands in number. Their dark forms may often be seen extending over the prairie as far as the eye can reach, a mighty moving mass of life. Onward they rush, moved by some sudden impulse, making the ground tremble under their feet, while their course may be traced by the vast cloud of dust which floats over them as they sweep across the plain. They are invariably followed by flocks of wolves, who pounce on any young or sick members of the herd which may be left behind. They range throughout the whole prairie country, from the "Fertile Belt," which extends from the Red River settlement to the Rocky Mountains in British Central America, to Mexico in the south. The bulls are at times excessively savage. They often quarrel among themselves, and then, falling out of the herd, they engage in furious combats,

greatly to the advantage of the pursuing wolves. In the summer, the buffalo delights in wallowing in mud. Reaching some marshy spot, he throws himself down, and works away till he excavates a mud-hole in the soil. The water from the surrounding ground rapidly drains into this, and covers him up, thus freeing him from the stings of the gnats and flies which swarm in that season.

The buffalo is hunted on horseback both by whites and by Indians, though the sport is one in which a considerable amount of danger must be braved. Let us set off from a farm in the Western States, on the border of the prairie. We have one or two nights to camp out before we reach the buffalo grounds. Mounting our horses by break of day, after an early breakfast, we ride on with the wind in our faces, and at length discover across the plain a number of dark objects moving slowly. They are buffaloes, feeding as they go. We see through our field-glasses that there are calves among them. It is proposed that some of our party should ride round, so as to stampede the herd back towards us, and thus, by dividing them, enable us to get in the centre. We wait for some time, when we see a vast mass of hairy monsters come tearing over a hill towards us. We have shot several of the bulls, but our object is to secure their calves and cows. As the herd approaches us, it swings round its front at right-angles, and makes off westward. We dash forward, and divide it into two parties. We also separate, some of our hunters following one part of the herd, the others the remainder. The enthusiasm of our horses equals our own. Away we go; nothing stops us. Now we plunge with headlong bounds down bluffs of caving sands fifty feet high,—while the buffaloes, crazy with terror, are scrambling half-way up the opposite side. Now we are on the very haunches of our game; now before us appears a slippery buffalo wallow. We see it just in time to leap clear, but the next instant we are in the middle of one. Our horses, with frantic plunges, scramble out; and on we go. We get closer and closer to the buffaloes, when a loud thundering of trampling hoofs sounds behind us. Looking over our shoulders, there, in plain sight, appears another herd, tearing down on our rear. For nearly a mile in width stretches a line of angry faces, a rolling surf of wind-blown hair, a row of quivering lights burning with a reddish-brown hue—the eyes of the infuriated animals. Should our horses stumble, our fate will be sealed. It is certain death to be involved in the herd. So is it to turn back. In an instant we should be trampled and gored to death. Our only hope is to ride steadily in the line of the stampede, till we can insinuate ourselves laterally, and break

out through the side of the herd. Yet the hope of doing so is but small.

On we rush rapidly as before, when suddenly, to our great satisfaction, the herd before us divides into two columns, to pass round a low hill in front. Still on we go, pushing our horses up the height. We reach the summit, the horses panting fearfully, and the moisture trickling in streams from their sides. But now the rear column comes on. They see us, not fifty rods off, but happily pay no attention to us. We dismount, facing the furious creatures. Should they not divide, but come over the hill, in a few moments we must be trampled to death. The herd approaches to within a hundred yards of the hill. We lift our rifles and deliver a couple of steadily aimed bullets at the fore-shoulders of the nearest bulls. One gives a wild jump, and limps on with three legs; the other seems at first unhurt; but just as they reach the foot of the mound, they both fall down. The whole host are rushing over them. We rapidly reload. The fate of their comrades, however, sends a panic into the hearts of the herd. Another falls just when they are so close that we could have sprung on their backs. At that moment they divide, and the next we are standing on a desert island, a sea of billowing backs flowing round on either side in a half-mile current of crazy buffaloes. The herd is fully five minutes in passing us. We watch them as they come, and as the last laggards pant by the mound we look westward and see the stampedeers halting. We soon understand the cause. They have come up with the main herd. Yes, there, in full sight of us, is the buffalo army, extending its deep line as far as the western horizon. The whole earth is black with them. From a point a mile in front of us, their rear line extends on the north to the bluffs bounding the banks of the river on which we had camped. On the south it reaches the summits of some distant heights fully six miles away. When it is known that with our field-glasses we can recognise an object the size of a buffalo ten miles distant, and that the mass extends even beyond the horizon, some idea may be formed of the immense number of animals congregated in the herd. To say that there are ten thousand, would be to give a very low estimate of their numbers.

The same writer from whose work the above is taken, describes an extraordinary instance of friendship exhibited by a buffalo bull for one of his comrades. (Generally speaking, the buffalo, even in the pairing season, will forsake the wounded cow, and the cow will not stay one moment to protect her hurt calf.) He was out hunting on one occasion, when, having been for some time unsuccessful, and being anxious to retrieve his character

by bringing home some meat to camp, he caught sight of two fine buffalo bulls on a broad meadow on the opposite side of a stream. Dismounting from his horse, he took steady aim at the nearest buffalo, which was grazing with its haunches towards him. The ball broke the animal's right hip, and he plunged away on three legs, the other hanging useless. He leaped on his horse, put spurs to its flanks, and in three minutes was close on the bull's rear. To his astonishment, and the still greater surprise of the two old hunters who came after him, the unhurt bull stuck to his comrade's side without flinching. He fired another shot, which took effect in the lungs of the first buffalo. The second moved off for a moment, but instantly returned to his friend. The wounded buffalo became distressed, and slackened his pace. The unwounded one not only retarded his, but coming to the rear of his friend, stood, with his head down, offering battle. "Here indeed was devotion which had no instinct to inspire it. The sight was sublime! The hunters could no more have accepted the challenge of the brave creature, than they could have smitten Damon at the side of Pythias. The wounded buffalo ran on to the border of the next marsh, and, in attempting to cross, fell headlong down the steep bank, and never rose again. Not till that moment, when courage was useless, did the faithful creature consider his own safety in flight. The hunters took off their hats as he walked away, and gave three parting cheers as the gallant buffalo vanished beyond the fringing timber."

The half-breed hunters of Rupert's Land make two expeditions in the year in search of buffaloes—one in the middle of June, and the other in October. They divide into three bands, each taking a separate route, for the purpose of falling in with the herds of buffaloes. These bands are each accompanied by about five hundred carts, drawn by either an ox or a horse. They are curious vehicles, roughly formed with their own axes, and fastened together with wooden pins and leather thongs, not a nail being used. The tires of the wheels are made of buffalo hide, and put on wet. When they become dry, they shrink, and are so tight that they never fall off, and last as long as the cart holds together. The carts contain the women and children, and provisions, and are intended to bring back the spoils of the chase. Each is decorated with some flag, so that the hunters may recognise their own from a distance. They may be seen winding off in one wide line extending for miles, and accompanied by the hunters on horseback. These expeditions run the danger of being attacked by the Sioux Indians, who inhabit the prairies to the south. The camps are therefore well surrounded by scouts, for the purpose of reconnoitring either

for enemies or buffaloes. If they see the latter, they make a signal by throwing up handfuls of dust; if the former, by running their horses to and fro.

Mr Paul Kane, the Canadian artist, describes one of these expeditions which he joined. On their way they were visited by twelve Sioux chiefs, who came for the purpose of negotiating a permanent peace; but whilst smoking the pipe of peace in the council lodge, the dead body of a half-breed, who had gone to a distance from the camp, was brought in newly scalped, and his death was at once attributed to the Sioux. Had not the older and more temperate half-breeds interfered, the young men would have destroyed the twelve chiefs on the spot: as it was, they were allowed to depart unharmed. Three days afterwards, however, the scouts were observed making the signal of enemies being in sight. Immediately a hundred of the best-mounted hastened to the spot, and concealing themselves behind the shelter of the bank of a stream, sent out two of their number as decoys, to expose themselves to the view of the Sioux. The latter, supposing them to be alone, rushed upon them; whereupon the concealed half-breeds sprang up and poured in a volley which brought down eight. The others escaped, though several must have been wounded.

Two small herds having been met with, of which several animals were killed, the scouts one morning brought in word that an immense herd of bulls was in advance about two miles off. They are known in the distance from the cows by their feeding singly, and being scattered over the plain,—whereas the cows keep together, for the purpose of protecting the calves, which are always kept in the centre of the herd.

We will start at daybreak with our friend, and a half-breed as a guide. Six hours' hard riding brings us to within a quarter of a mile of the nearest herd. The main body stretches over the plains as far as the eye can reach, the wind blowing in our faces. We should have liked to have attacked them at once, but the guide will not hear of it, as it is contrary to the law of his tribe. We therefore shelter ourselves behind a mound, relieving our horses of their saddles to cool them. In about an hour one hundred and thirty hunters come up, every man loading his gun, looking to the priming, and examining the efficiency of his saddle-girths. The elder caution the less experienced not to shoot each other,—such accidents sometimes occurring. Each hunter then fills his mouth with bullets, which he drops into the gun without wadding; by this means loading more quickly, and being able to do so whilst his horse is at full speed. We slowly

walk our horses towards the herd. Advancing about two hundred yards, the animals perceive us, and start off in the opposite direction, at the top of their speed. We now urge our horses to full gallop, and in twenty minutes are in the midst of the stamping long-haired herd. There cannot be less than four or five thousand in our immediate vicinity,—all bulls; not a single cow amongst them. The scene now becomes one of intense excitement,—the huge bulk thundering over the plain in headlong confusion, while the fearless hunters ride recklessly in their midst, keeping up an incessant fire but a few yards from their victims. Upon the fall of each buffalo the hunter merely throws, close to it, some article of his apparel to denote his own prey, and then rushes on to another. The chase continues for about one hour, extending over an area of about six square miles, where may be seen the dead and dying buffaloes to the number of five hundred. In spite of his horsemanship, more than one hunter has been thrown from his steed, in consequence of the innumerable badger-holes in which the plains abound. Two others are carried back to camp insensible. We have just put a bullet through an enormous bull. He does not fall, but stops, facing us, pawing the earth, bellowing, and glaring savagely. The blood is streaming from his mouth, and it seems as if he must speedily drop. We watch him, admiring his ferocious aspect, combating with death. Suddenly he makes a dash towards us, and we have barely time to escape the charge; when, reloading, we again fire, and he sinks to the ground.

The carts bring in the slaughtered animals to the camp, when the squaws set to work, aided by the men, to cut them up, and prepare them for drying and for making pemmican. The women are soon busily employed in cutting the flesh into slices, and in hanging them in the sun on poles. The dried meat is then pounded between two stones till the fibres separate. About fifty pounds of it is put into a bag of buffalo skin, with about forty pounds of melted fat, which, being mixed while hot, forms a hard and compact mass. Hence its name, in the Cree language, of pemmican—*pemmi* signifying meat, and *kon* fat—usually, however, spelt pemmican. One pound of pemmican is considered equal to four pounds of ordinary meat,—and it keeps for years, perfectly good, exposed to any weather.

The prairie Indians obtain buffaloes by driving them into huge pounds, where they are slaughtered. The pounds, however, can only be made in the neighbourhood of forests, from whence the logs for their formation can be obtained. The pound consists of a circular fence about 130 feet broad. It is constructed of the

trunks of trees laced together with withies, with outside supports about 5 feet high. At one side an entrance is left about 10 feet wide, with a deep trench across it, on the outside of which there is a strong trunk of a tree placed, about a foot from the ground. The animals, on being driven in, leap over this, clearing the trench, which of course prevents them from returning. From the entrance two rows of bushes or posts, which are called "dead men," diverge towards the direction from which the buffaloes are likely to come. They are placed from 20 feet to 50 feet apart, and the distance between the extremities of the two rows at their outer termination is nearly two miles. Behind each of these "dead men" an Indian is stationed, to prevent the buffaloes when passing up the avenue from breaking out. Meantime, the hunters, mounted on fleet horses, range the country to a distance of eighteen or twenty miles in search of a herd. The buffalo has an unaccountable propensity which makes him endeavour to cross in front of the hunter's horse. They will frequently, indeed, follow a horseman for miles in order to do so. He thus possesses an unfailing means, by a dexterous management of his horse, of conducting the animals into the trap prepared for them. The men also conceal themselves in hollows and depressions in the ground, so as to assist in turning the herd, should they attempt to escape in that direction. And now some three or four hundred head of shaggy monsters are driven to the expanded mouth of the avenue. The horsemen follow in their rear, and prevent them turning back. Meantime the Indians stationed behind the "dead men" rise, shaking their bows, yelling, and urging them on. Thus they proceed, madly rushing on, the passage growing narrower and narrower, while they, pressed together, are unable to see the danger ahead. The foremost at length reach the fatal ditch, and leaping over, enter the pound, the rest madly following. "The animals now begin to gallop round and round the fence, looking for some means of escape; but women and children on the outside, keeping perfectly silent, hold their robes before every orifice, till the whole herd is brought in. They then climb to the top of the fence, and the hunters, who have followed closely in the rear of the buffaloes, spear and shoot with bows and arrows or firearms at the bewildered animals, rapidly becoming frantic with fear and terror in the narrow limits of the pound. A dreadful scene of confusion and slaughter then ensues. The older animals toss the younger. The shouts and screams of the Indians rise above the roar of the bulls, the bellowing of the cows, and the moaning of the calves. The dying struggles of so many powerful animals crowded together, create a revolting scene, dreadful for its excess of cruelty and waste of life." (Hind.)

In consequence of this wholesale and wanton destruction, the buffalo has greatly diminished; and the Indians agree in the belief that their people, in like manner, will decrease till none are left. It is computed that for many years past no less than 145,000 buffaloes have annually been killed in British territory; while on the great prairies claimed by the United States a still greater number have been slaughtered. In one year—1855—on the British side of the boundary, there were 20,000 robes of skins received at York Factory alone; and probably not fewer than 230,000 head of buffalo were slaughtered in the previous year. This number would have been sufficient to sustain a population of a quarter of a million. Yet so vast a number of the animals are left to rot on the ground, that in all probability not more than 30,000 Indians fed on the flesh of the slaughtered buffaloes.

The civilised fur-traders, however, with greater forethought, take means to preserve the flesh of the animals they kill in the neighbourhood of the forts, so that it may last them through the summer. For this purpose they dig a square pit capable of containing seven or eight hundred carcasses. As soon as the ice in the river is of sufficient thickness, it is cut with saws into square blocks, of a uniform size, with which the floor of the pit is regularly paved. The blocks are then cemented together by pouring water in between them, and allowing it to freeze into a solid mass. In like manner the walls are built up to the surface of the ground. The head and feet being cut off, each carcass, without being skinned, is divided into quarters; and these are piled in layers in the pit, till it is filled up, when the whole is covered with a thick coating of straw, which is again protected from the sun and rain by a shed. In this manner the meat is preserved in good condition through the whole summer, and is considered more tender and better flavoured than when freshly killed.

Even in the winter the buffalo continues to range over the plains in a far northern latitude. Mr Kane mentions seeing a band, numbering nearly ten thousand, at the very northern confines of the Fertile Belt, where the snow was very deep at the time. They, however, had never before appeared in such vast numbers near the Company's establishments. Some, on that occasion, were shot within the gates of Fort Edmonton. They had killed with their horns twenty or thirty horses, in their attempt to drive them from the patches of grass which the horses had laid bare with their hoofs. They were probably migrating northward, to escape the human migrations so rapidly

filling up the southern and western regions which were formerly their pasture-grounds.

The Cree Indians use dogs to draw their sleighs. They are powerful, savage animals, having a good deal of the wolf about them. They are considered as valuable as horses, as everything is drawn over the snow by them. When buffaloes have been killed in winter, the dead animals are drawn in by them to the camp; and two can thus easily drag a large cow buffalo over the snow. The sleigh or cariole used in these regions is formed of a thin flat board about eighteen inches wide, bent up in front, with a straight back behind to lean against. The sides are made of fresh buffalo hide, with the hair completely scraped off, and which, lapping over, entirely covers the front part, so that a person slips into it as into a tin bath. Each carries but one passenger. The driver, on snow-shoes, runs behind to guide the dogs. Each sleigh is drawn by four dogs, their backs gaudily decorated with saddle-cloths of various colours, fringed, and embroidered in the most fantastic manner, and with innumerable small bells and feathers. Two men run before on snow-shoes to beat a track, which the dogs instinctively follow. A long cavalcade of this description has a very picturesque appearance.

While thus travelling, our friend Mr Kane caught sight of a herd of buffaloes, which did not perceive the approach of the party till the foremost sleigh was so near as to excite the dogs, who rushed furiously after them, notwithstanding all the efforts of the drivers to keep them back. The spirit of the hunt was at once communicated through the whole line, and the entire party were in an instant dashing along at a furious rate after the buffaloes. The frightened animals made a bold dash at length through a deep snow-bank, and attempted to scramble up the steep side of the river, the top of which the foremost one had nearly reached, when, slipping, he rolled down and knocked over those behind, one on the top of the other, into the deep snow-drift, from which men and dogs were struggling in vain to extricate themselves. It would be impossible to describe the wild scene of uproar that followed. One of the sleighs was smashed, and a man nearly killed; but at length the party succeeded in getting clear, and repairing the damage.

In some districts, where the buffaloes can with difficulty be approached, the Indians employ a stratagem to get them within reach of their arrows or rifles. One of the Indians covers himself in a wolf's skin, another with a buffalo skin. They then crawl on all-fours within sight of the buffaloes, and as soon as they have

engaged their attention, the pretended wolf jumps on the pretended calf, which bellows in imitation of the real one. The buffaloes are easily deceived in this way, as the bellowing is generally perfect, and the herd rush on to the protection of their supposed young, with such impetuosity that they do not perceive the cheat till they are quite close enough to be shot.

On one occasion Mr Kane and his Indian companion fell in with a solitary bull and cow. On this they made a "calf," as the ruse is called. The cow attempted to spring towards them, but the bull, seeming to understand the trick, tried to stop her by running between them. The cow now dodged and got round him, and ran within ten or fifteen yards of the hunters, with the bull close at her heels, when both men fired, and brought her down. The bull instantly stopped short, and, bending over her, tried to help her up with his nose—evincing the most persevering affection for her; nor could they get rid of him, so as to cut up the cow, without shooting him also, although at that time of the year bull flesh is not valued as food when the female can be obtained. This, and another example which has been given, show that these animals are capable of great affection for each other.

The Indians also occasionally approach a herd from leeward, crawling along the ground so as to look like huge snakes winding their way amid the snow or grass, and can thus get sufficiently near to shoot these usually wary animals.

Part 1—Chapter VI.

Rodents.

The Beaver.

Of all mammals, the beaver is the most especially fitted to enjoy a social life. When in captivity and away from its kind, it appears to possess but a small amount of intelligence; it forms no attachments to its human companions, and is utterly indifferent to all around it. But in its native wilds, associated with others of its race, what wondrous engineering skill it exhibits, and how curious are its domestic arrangements!

It is essentially a hard worker. Other animals sport and play and amuse themselves. What young beavers may do inside their lodges, it is difficult to say; but the elders, from morn till night,

and all night long, labour at their various occupations, evidently feeling that they were born to toil, and willingly accomplishing their destiny.

The beaver has fitly been selected as the representative animal of Canada, on account of its industry, perseverance, and hardihood, and the resolute way in which it overcomes difficulties. Certain conditions of country are necessary to its existence, and when it does not find these ready formed, by a wonderful provision of Nature its instinct enables it to produce them by its own exertions. Where it can find rivers, brooks, and swampy lakes which maintain an even level throughout the year, the beaver has a tolerably idle life; but as in most districts the levels of rivers and lakes are apt to sink at various seasons if left to themselves,—whenever an emigrant party of beavers have fixed on a new locality, they set to work to dam up the stream or outlet of the lake, to prevent a catastrophe which might bring ruin and destruction on their new colony. In Nova Scotia, as well as in other parts of North America, large level spaces are found covered with a rich alluvial soil, from which spring up waving fields of wild grass. From this the human settler draws an abundant supply of hay for his stock in winter, and ought to feel deeply indebted to the persevering beaver for the boon. They are known as “wild meadows,” and are of frequent occurrence in the backwoods. It is evident that they were formed by the following process:—They are found in valleys through which, in ages past, a brook trickled. A party of beavers arriving, and finding an abundance of food on the side of the hills, would set to work to form a dam of sufficient strength to keep back the stream, till a pond was created, on the edge of which they might build their dome-shaped habitations. Extensive spaces in the woods were thus inundated, and the colony of beavers lived for long years on the banks of their artificial lakes. They, however, lacking forethought, like many human beings, did not sufficiently look to the future. In process of time the trees, being destroyed, decayed and fell; while the soil, washed down from the surrounding hills, filled up the pond constructed by the industrious animals, and they were compelled to migrate to some other region, or were destroyed. The dam being thus left unrepaired, the water drained through it, and the level space was converted into the rich meadow which has been described. Beavers’ houses, however, are seen in all directions, sometimes on the banks of these artificial ponds, at others by the sides of large lakes or rivers. Though varying in size, they all greatly resemble a huge bird’s-nest turned upside down. Some are eight feet in diameter, and three feet in height; while others are

very much larger, being no less than sixteen to twenty feet in diameter, and nearly eight feet in height on the outside, and perfectly circular and dome-shaped. The walls and roofs of these lodges, as they are called, are several feet in thickness, so that the measurement of the interior chamber is little more than half that of the exterior. Several beavers inhabit a large lodge. Their beds, which are separated one from the other, are arranged round the walls, a space in the centre being left free. The exterior also presents a very rough appearance, consisting of sticks apparently thrown loosely together, and entirely denuded of their bark, as also of branches of trees and bushes closely interwoven and mixed with stones, gravel, or mud. They are close to the banks, almost overlapping the water, into which the front part is immersed. The bottom of the stream or lake is invariably deepened in the channel approaching the entrance, thus ensuring a free passage below the ice into the structure. The tunnel is from two to three feet long. In the inner part of the hut the materials are laid with greater care, and more firmly bound together—with mud and grass—than on the outer. Even in one of the larger houses the chamber—for there is but one—is only between two and three feet in height, though as much as nine feet in diameter. It slopes gently upwards from the water. Inside there are two levels: the lower one may be called the hall. On this the animals shake themselves when they emerge from the subaqueous tunnel; and when dry, clamber up to the upper story, which consists of an elevated bed of boughs running round the back of the chamber. It is thickly covered with dry grass and thin shavings of wood. The whole of the interior is smooth, the ends of the timbers and brushwood which project inwards being evenly gnawed off. There are always two entrances—the one serving for summer, and letting in the light; while another sinks down at a deeper angle, to enable the owners during winter to get below the water. Beavers are especially clean animals, and allow no rubbish to remain in their abode; and as soon as they have nibbled off the bark from the sticks, they carry them outside, and place them on the roof of their hut, to increase its thickness, or let them float down the stream.

During the summer they are employed all day in ranging the banks and cutting provisions for their winter consumption, all their architectural occupations being carried on at night. Their winter stock of food consists of short lengths of willow and poplar,—the bark of which only, however, they eat. These they sink with mud or stones in some quiet pool near their lodge, and when required for food they dive down below the ice and bring up as many as are required for family consumption.

Besides their lodge, they form in the neighbourhood a long burrow sufficiently broad to enable them to turn with ease. The entrance is at a considerable depth below the surface of the water, and extends from ten to twenty feet into the bank. This burrow serves as a safe retreat, should their house be broken into, and thither they immediately fly when their permanent abode is attacked. In summer they regale themselves on the roots of the yellow lilies, as well as on other succulent vegetation, and any fruits the country affords.

But it is time that we should get a look at the curious animal itself. We may paddle gently in a birch-bark canoe over a calm lake, and conceal ourselves among the tall grass in some quiet cove where the yellow water-lilies float on the tranquil surface. Through the still air of evening, the sound of the distant waterfall reaches our ears. Wood ducks fly by in vast numbers; the rich glow of the evening sky, still suffused with the gorgeous hues of the setting sun, is reflected on the mirror-like expanse of water. Watching with eager eyes, we see at length the water breaking some forty yards away, and the head and back of an animal appears in sight. Now another, and then a third, come into view. After cautiously glancing around, the creatures dive, with a roll like that of a porpoise, but shortly appear again. Our Indian, pushing the light canoe from amid the grass, paddles forward with eager strokes. One of our party fires, and misses, the echoes resounding from the wood-covered shores, and from island to island, till lost in the distance; but the cautious animals, forewarned, take good care not to appear again during that evening. We find that our only prospect of examining them is by trapping one in the usual Indian fashion, which we will by-and-by describe.

Mr Beaver, as the Indians are fond of calling the animal, has a body about three feet long, exclusive of the tail, which is a foot more. He wears on his back a coat of long shining hair, generally of a light chestnut colour, but sometimes of a much darker hue, occasionally perfectly black. Below the hair, next the skin, is a fine, soft, greyish-brown wool. He may be known at once by his broad horizontal flattened tail, which is nearly of an oval form, but rises into a slight convexity on its upper surface, and is covered with scales. His fore-feet are armed with nails, and serve for the purpose of hands—indeed, he vies with the monkey in the use he can make of them. The hind-feet are webbed, and with these—together with his tail, which acts as a rudder—he is enabled to swim rapidly through the water. The beaver is a rodent, with a short head and broad blunt snout, and his incisor teeth are remarkably large and hard, enabling

him to bite through wood with wonderful ease and rapidity. So great is their hardness, that formerly the Indians were accustomed to use them as knives for cutting bone and fashioning their horn-tipped spears.

The beaver, it has been said, always chooses banks by the side of a lake or river of sufficient depth to escape being frozen to the bottom, even during the hardest frost. Thus, he can at all times obtain a supply of water, on which his existence depends; indeed, the bark on which he lives requires to be moistened before it becomes fit for food. When instinct teaches a colony of beavers that the water is not of sufficient depth to escape freezing throughout, they provide against the evil by making such a dam as has been mentioned, across the stream, or the outlet of the lake, at a convenient distance from their habitations. The plan of these dams varies according to the character of the lake or stream. If the current is but slight, they build the dam almost straight; but where the water runs at a rapid rate, it is almost always constructed with a considerable curve, the convex side towards the stream. Frequently, in such cases, if there is any small island in the centre, it is taken advantage of, and the dam is built out to it from either bank. They make use of a variety of materials; employing driftwood when it can be obtained, to save themselves the trouble of cutting down trees. This they tow to the spot, and sink it horizontally with mud and stones. They also employ pieces of green willows, birch, and poplars, intermixing the whole with mud and gravel, in a manner which contributes greatly to the strength of the dam. They observe, however, no order or method in the work, placing their materials as they can obtain them, except that they make the dam maintain its regular sweep, and form all parts of equal strength. They carry the mud and stones in their fore-paws; and in one night will collect as much as amounts to many thousands of their little loads. When driftwood is not to be found, they obtain the timber they require from the groves skirting the lake or pond. To do this, they squat on their hams, and rapidly gnaw through the stems of trees from six to twelve or fourteen inches in diameter, with their powerful incisors. Sometimes a tree will not fall prostrate, the boughs being caught by its neighbours. But the beaver is not to be disappointed; he sets to work and gnaws away a little above the first place, thus giving it a fresh start, in order that the impetus may disengage it from the branches which keep it up. The tree being cut up, the beavers, uniting, tow the pieces down to the dam. They then plunge into the water and bring up the mud and small stones with which to keep it sunk. A long constructed dam, by being frequently repaired with fresh mud,

becomes at length a solid bank, capable of resisting a heavy rush, either of water or ice; and as the willow, poplar, and birch generally take root and shoot up, they by degrees form a regularly planted hedge, which in some places becomes so tall that birds have been known to build their nests among the branches. These beaver dams also form bridges, over which two or three men may pass abreast, and lead their horses, without risk of breaking through. So rapidly do the members of the industrious community labour, that even the most serious damage to their dams, or habitations, is quickly repaired. They always carry the mud and stones in their fore-paws, pressed against their chins, but they drag the wood with their teeth.

The creature does not employ its broad tail, as was once supposed, to plaster down its mud-work, nor does it use it as a vehicle for transporting materials; its sole object being to guide it when in the water, and as a counterpoise, by moving it in an upward direction, to the tendency it would otherwise have of sinking head-foremost. The creatures cover the outside of their houses every autumn with fresh mud as soon as the frost becomes severe. By this means it freezes as hard as stone, and prevents their common enemy, the wolverene, disturbing them during the winter. From the beaver being seen to flap its tail when moving over its work, but especially when about to plunge into the water, has arisen the idea that it uses this member as a trowel. This custom it preserves even when it becomes tame and domesticated, particularly when suddenly startled.

The beaver, says Captain Hardy, travels a long distance from his house in search of materials, both for building and food. He mentions having seen the stumps of some trees which had been felled, at least three-quarters of a mile from the beaver lodges. Its towing power in the water, and that of traction on dry land, is astonishing. The following account shows the coolness and enterprise of the animals, described by a witness to the fact:—The narrator having constructed a raft for the purpose of poling round the edge of the lake to get at the houses of the beaver, which were built in a swampy savannah, otherwise inaccessible, it had been left in the evening moored at the edge of the lake, close to the camp, and about a quarter of a mile from the nearest beaver's house, the poles lying on it. Next morning, on going down to the raft, the poles were missing; so, cutting fresh ones, he started with the Indians towards the beaver village. On reaching their abodes, one of the poles was found deposited on the top of the houses.

In a community of beavers there are frequently some who appear to do no work, and are called by the Canadian trappers *Les paresseux*, or Idlers. They live apart from the rest, taking up their abodes in long tunnels, which they excavate. Several inhabit the same burrow; and being males, the idea is that they have been conquered in the combats which take place among the males when seeking their mates, and thus, like monks of old, have retired from the world,—or perhaps it may be only for a period, till they have regained sufficient courage and strength to sally forth, and commence a happier existence with the partner of their choice. They are far more careless of their safety than the other beavers, and are thus easily caught by the trappers.

The body of the beaver contains a curious odoriferous substance, called by the trappers barkstone, but more scientifically "castor," or "castoreum." It is contained in two little bags about the size of a hen's egg, and is of a brownish, unctuous consistency. At one time it was supposed to possess valuable medicinal properties. It is now, however, chiefly employed by perfumers. The beavers themselves are strangely attracted by this substance, and when scenting it at a distance will invariably make their way to it. It is said that the inhabitants of a particular lodge go forth, and having rid themselves of their superabundant castoreum at a little distance, return home; when the beavers of another lodge, scenting the castoreum, proceed to the same spot, and covering it over with a layer of earth and leaves, deposit their own castoreum upon the heap. After a time, the former beavers go through the same process; and this is continued until a mound of three or four feet in height has been raised. It is difficult to account for the object of this strange proceeding. It was not, however, till of late years that the sagacious Indians discovered that the castoreum was a certain bait for the animals themselves. Formerly, the bait they employed was a piece of green aspen, beaten up, and placed near the trap. At length an Indian tried whether a male might not be caught by adding some of the castoreum. By that time steel traps had been introduced, instead of the clumsy wooden traps before used. Not only were the males caught, but the females also; and the trappers were now able with their steel traps to catch vast numbers of the infatuated animals. It is said that the creatures, when perceiving the scent, will sit upright, snuffing about in every direction, and squealing with excitement. The younger animals, however, are those chiefly caught. The old ones are often too cunning; and it is affirmed that, instead of touching the bait, they will cover up the trap with mud and stones till a

mound has been raised, and then, depositing their superabundant castoreum upon it, take their departure.

We must conclude our account by again quoting Captain Hardy. Of the infatuation of this animal for castoreum he saw several instances. "A trap was fastened by its steel chain to a stake, to prevent the beaver, when caught, taking it away. It slipped, however, and the beaver swam away with the trap, and it was looked upon as lost. Two nights afterwards he was again taken in a trap, with the other fast on his thigh. Another time a beaver, passing over a trap to get the castoreum, had his hind-leg broken. With his teeth he cut the broken leg off, and went away. It was supposed that he would not come again; but two nights afterwards he was found fast in a trap—in each case tempted by the castoreum. The stake was always licked, or sucked, clean. The substance seems to act as a soporific, as the creatures, after tasting it, always remain a day without coming out of their houses. So wary generally are the beavers, that a trapper is always careful not to leave his scent on the spot. To avoid this he frequently cuts down a tree, and walks on its branches towards the edge of the path, afterwards withdrawing it, and plentifully sprinkling water around."

The Indians and Canadian voyageurs eat the flesh of the beaver, esteeming it, when roasted with the skin on—the hair having been singed off—the most dainty of dishes. Early in this century, when beaver fur was much in demand for the manufacture of hats, upwards of 120,000 skins were exported from Quebec alone in one year. The warfare long waged against the unfortunate rodents now goes on with somewhat diminished activity. A change of fashion—the substitution of silk for beaver—has probably saved them from utter extermination. The scientific name of their tribe, *Castor*, was long a popular term for a hat; but now that their fur has ceased to be employed as formerly, the term itself appears to have gone out of use.

The Musk-Rat, or Musquash.

Voyaging along the margin of a lake, we may see on the shores numbers of little flattened oval nests composed of reeds and sedges, while numerous holes in the bank, with quantities of shells, chiefly of the fresh-water mussel, scattered round, show the entrance to the habitations of the musquash, or ondatra, called also the musk-rat. As evening approaches, the creatures may be seen in fine balmy weather gambolling on the surface, swimming rapidly here and there, or now and then diving below, apparently fearless of the passing canoe. The little

sedge-built hut of the water-rat is constructed much in the same way as the beaver's larger mansion. The creature itself looks somewhat like the beaver, and some of its habits are also similar. It is rather more than two feet in total length, of which measurement about ten inches is occupied by the tail. The upper part of the body is of a dark brown colour, tinged in parts with a reddish hue, while the lower part is ashy grey. Its tail is flattened, but vertical. Like the beaver, it is furnished with an undercoat of soft downy fur. Its safety has been provided for by its peculiar colour, which is so like that of the muddy bank on which it dwells, that a keen eye can alone detect it. Its hinder feet are webbed, the imprint on the soft mud being very similar to that of a duck. With the exception of the flesh of the water-mussel, its food is vegetable. It is a great depredator in gardens, which it has been known to plunder of carrots, turnips, and maize—the stalks of which it cuts close down to the ground.

It is sought-for on account of its fur, which is very valuable. The traps are set close to a tree, and when one of the creatures is caught, its companions will instantly attack it and tear it to pieces. Generally, however, in its struggles to get free, it carries the trap under the surface, and is thus drowned.

Audubon, the naturalist, gives us an interesting description of them:—"They are very lively, playful animals, when in their proper element—the water—and on a calm night, in a sequestered pool, may often be seen crossing and recrossing in every direction, leaving long ripples in the water behind them, while others stand for a few moments on tufts of grass, stones, or logs, and then plunge over, one after the other, into the water. At the same time others are feeding on the grassy bank, dragging off the roots of various kinds of plants, or digging underneath the edge. These animals seem to form a little community of social playful creatures, who only require to be unmolested in order to be happy."

It has been proposed to acclimatise these little rodents in England, under the idea that thus a valuable addition to the bank fauna of sluggish English streams would be obtained.

Prairie-Dogs.

Vast cities, with regularly laid streets, are often met with in extensive level spots on the prairie. The inhabitants are, however, not men, but creatures the size of a guinea-pig—rodents—a species of marmot. In their habit of associating together in communities, they put us in mind of the industrious

beaver; but they are idle little fellows, evidently liking play better than work. Their heads are not unlike those of young terrier-pups, and their bodies are of a light brown colour. They have little stumpy tails, which, when excited, they constantly jerk up and twist about in a curious fashion. Their habitations are regular cones raised two or three feet above the ground, with a hole in the apex, which is vertical for the depth of two or three feet, and then descends obliquely into the interior. From the peculiar yelp or short squeaky bark which they give, the hunters call them prairie-dogs.

In each separate community, which consists of many thousand individuals, there is a president dog, who seems to have especial charge of the rest. As a stranger approaches, the creatures who are out of their houses scamper back as fast as their legs will carry them, and concealing all but their heads and tails, utter loud barks at the intruder. This done, the greater number dive out of sight with a curious somersault, their little tails whisking in the air. The chief dog, and perhaps two or three other sentinels with him, remain on the tops of their houses barking lustily till the enemy gets within a few paces of them, when they also disappear, and the town remains silent and deserted. The traveller who wishes to observe their habits, by lying concealed and silent for a few minutes, may see after a time some little fellow pop his head out of his house, when he gives a few barks. It serves as a signal to the rest that danger has disappeared, and immediately the others emerge from their houses and begin to frisk about as usual.

The holes of these curious creatures are shared by two very different species of guests, one of which, at all events, must prove most, unwelcome. One of these is a little owl, which may be seen sitting in front of the burrows or flying about near the ground; or, when the sun sinks low, hopping through the town, and picking up the lizards and chameleons which everywhere abound. He can apparently do no harm to the inhabitants, if he fails to benefit them. The other inmates are rattlesnakes, who, regardless of any objections which may be raised by the dogs, take possession of their holes, and when the sun shines lie coiled up at their sides, now and then erecting their treacherous heads and rattling an angry note of warning, should a thoughtless pup by any chance approach too near. The Indians suppose that all three creatures live on the most friendly footing; but as the rattlesnakes when killed have frequently been found with the bodies of the little prairie-dogs in their insides, their object in establishing themselves in the locality seems very evident.

The poor little dog, indeed, leads a life of constant alarm, with numerous enemies ever on the watch to surprise him. Hawks and eagles, hovering high in air, often pounce down and carry off unfortunate members of the community in their powerful talons. The savage cayote, or prairie-wolf, when pressed by hunger during the winter, frequently attacks the dome-shaped habitation of the little animal, and with claws and teeth tears to pieces the walls, plunging his nose into the passage which he has opened, and working his way down till he seizes the trembling little inmate, who in vain retreats to the inmost recesses of his abode.

It has been supposed that the prairie-dog hibernates; but this is not the case, though he lays in a store of provision for winter consumption—he being as lively at that period as at any other, though he wisely prefers keeping within the house while the icy blasts blow across the plains. The creature is especially tenacious of life, and even when shot through the body will manage to gain his burrow at rapid speed. He does not run into it, but, like the rabbit, he makes a jump in the air, turns what looks like a somersault, and, flourishing his hind-legs and whisking his tail, disappears as if by magic. In an instant afterwards, however, his little sparkling eyes and nose may be seen above the ground; and if no stranger is in sight, he, with the rest of the community, will commence gambolling and frisking about, forgetful of his numerous foes and previous alarm. It is very difficult to obtain a specimen of the prairie-dog, as, even if mortally wounded, he generally tumbles into his hole before being captured. The inhabitants of the plain, however, manage to catch the animal alive by dragging a cask of water to one of their holes which does not communicate with the rest of the village. They then pour the water down the hole, either drowning the creature or compelling him to come out. He is very soon reconciled to a state of captivity, and after two days appears on the most intimate terms with his captors. Even when turned loose again the creatures will not leave the neighbourhood of the house, but burrow under the foundation, making themselves quite at home, and fearlessly come out to be fed when summoned by a whistle. They become, indeed, very interesting and pretty little pets.

We shall meet with a similar animal on the pampas of South America, and which has also the companionship of a little owl.

There are several other species of marmot in America. One is called the Quebec Marmot, which lives a solitary life, making an

almost perpendicular burrow in dry ground at a distance from water.


The beautiful little, often-tamed Woodchuck, is another American marmot. It makes a deep burrow in the sides of hills, lining the chamber at the inner end with dry leaves and grass. It may frequently be seen by the traveller running rapidly along the tops of fences, as if to keep company with him—now getting ahead, then stopping and looking back to see if he is coming, and then going on again, till, growing tired of the amusement, it gives a last stare and then scampers back the way it has come.

The Porcupine.

Unattractive as the fretful porcupine appears when considered as a means of satisfying man's hunger, it is hunted throughout North America for the sake of its flesh, which forms an especially dainty dish, not only in the opinion of the Indians, but in that of every European who has partaken of it. The creature dwells in small caverns, either under a pile of boulders, or amid the roots of large trees; but it also, with its sharp claws, easily climbs up the trunks, and may sometimes be seen reposing on their very summits, where it feeds on the bark of the young branches, or the berries when they become ripe.

The Canadian porcupine is also known as the cawquaw or urson. It is nearly four feet long altogether, the head and body measuring upwards of three feet, while the tail is about three inches in length. It is less completely defended with spines than the porcupines of other countries—part of its body being covered with long, coarse brown hair, which almost conceals the deeply-set, short, pointed quills, except those on the head, hind-quarters, and tail. The spines are about three inches long. When the animal is brought to bay, it sets them up in a fan-like shape, and presents a formidable row of points turned towards its opponent. When attacked, it defends itself with its thick, muscular tail; and wherever it strikes, it leaves a number of its easily-detached quills, with barbed points, sticking firmly in its opponent's body. These spines are of a dull white colour, the points being dark. Awkward as the porcupine looks, it can gallop along at considerable speed; and when surprised, generally escapes to its rocky den—or if it gains a tree, scrambles up the trunk at a rapid rate. A broad trail leads to the porcupine's den, by which it is easily discovered, as also by the ordure outside the entrance. A number of these paths lead from the den to its feeding-ground: in the autumn to a beech grove, on the mast or nuts of which it revels; and in the winter-time, to some tall

hemlock or spruce trees. The Indian hunter also discovers it by the marks of its claws on the bark; and should he be unfortunate in his search for larger game, he seldom fails to obtain a roast of porcupine. The creature is hunted by the Indians with little dogs, which seem to take great delight in the sport, and, in spite of the formidable weapons of their opponents, will rush in and draw them out of their dens without

injury to themselves. Even the settlers' dogs exhibit  the same strong fancy for hunting porcupines, but are not so successful in coming off without injury; indeed, they often issue from the combat covered over with spines sticking in their flesh.

Captain Hardy gives us an anecdote of the extraordinary fancy the Indian dogs have for hunting porcupines. One of these dogs was quite blind; and yet, if the porcupine "treed," the little animal would sit down beneath, occasionally barking to inform his master where lodged the fretful one. Another dog was not to be beaten when once on a porcupine. If the animal was in its den, in he went, and, if possible, would haul it out by the tail; if not strong enough, his master would fasten a handkerchief round his middle, and attach to it a long twisted withe. The dog would go in, and presently, between the two, out would come the porcupine.

By the end of the "fall," the animal becomes loaded with fat, from feeding on the berries found in the "barrens." Its cry is a plaintive, whining sound, not very dissimilar to that of a calf moose. The female produces two at a birth early in the spring. The porcupine can easily be tamed; and Audubon mentions one which was so entirely domesticated, that it would come voluntarily to its master, and take fruit or vegetables out of his hand, rubbing against him as does an affectionate cat. The same animal, however, showed considerable courage. On one occasion it was attacked by a ferocious mastiff. One morning the dog was seen making a dash at some object in the corner of the fence. This proved to be the tame porcupine, which had escaped from its cage. The dog seemed regardless of all its threats, and probably supposing it to be an animal not more formidable than a cat, sprang at it with open mouth. The porcupine seemed to swell up, in an instant, to nearly double its size; and as the dog sprang upon it, dealt him such a sidewise blow with the tail, as to cause the mastiff to relinquish his hold instantly, and set up a howl of pain. His mouth and nose were full of quills. He could not close his jaws, but hurried, open-mouthed, off the premises. Although the servants instantly extracted the spines from the mouth of the dog, his head was terribly pierced, and it was several weeks before he recovered.

The porcupine, however, suffered severely from the combat; and as the hot weather came on, showed great signs of distress, and finally died of heat.

The quills of the porcupine are brilliantly stained by the Indians with a variety of colours, and are extensively used by their squaws in ornamenting with fanciful patterns the birch-bark ware which they sell to the white settlers.

Part 1—Chapter VII.

Carnivora.

The Black Bear.

Several species of the bear tribe inhabit America; the two most numerous of which are the black bear, or musquaw, and the far-famed ferocious grizzly bear of the Rocky Mountains. The black bear is found generally among the forests and plains of the east, though the grizzly also descends from his mountain fastnesses, and makes his way through the low country to a considerable distance from his usual abode. Although the black bear has not obtained the same character for fierceness as his grizzly relative, he often proves a formidable opponent when attacked by human foes, and is also dreaded on account of his depredations among their flocks and herds. He is, indeed, a monstrous and powerful animal, often reaching six feet in length from the muzzle to the tail—the tail being only about two inches long—while he stands from three to three and a half feet in height at the shoulder. He is covered with a smooth and glossy coat of thick hair, without any wool at the base. He does not always wear a black suit; sometimes he puts on a brown one. When his coat is perfectly black, he has a cinnamon patch on his muzzle. He varies, too, in shape. Occasionally he is long and low, at others his body is short,—and he has great length of limb. Under ordinary circumstances, he restricts himself to a vegetable diet, but is very fond of a small species of snail which feeds on the prairie grass; and, like others of his relatives, he is greatly addicted to honey. As his feet are furnished with strong sharp claws, he is able to make his way up the trunks of trees to reach his favourite food. In this object he displays great perseverance and acuteness. However high up it may be, or in positions most difficult of access, he will manage to reach the combs containing the sweet repast. Should the comb be hidden away in the hollow of some aged tree, with an entrance too

small for admitting his huge paw, he sets to work with his teeth, and gnaws away the wood till he has formed a breach of sufficient size to allow him to put it in. He is utterly regardless of the assaults of the tiny inhabitants of the comb; and scooping out their honey and young together with his fore-paws, devours



the whole mass. He will sometimes, when pressed by hunger, break into the settler's barn and carry off sheep, pigs, and small cattle into the neighbouring woods; and so cunning is he, that it is not often he is overtaken, or entrapped in the snare laid for his capture.

The Indians of Nova Scotia call him Mooin, which reminds us of Bruin. The Indians throughout the country pay great respect to the bear, having, like the Esquimaux, a high opinion of his intellectual powers, and believing that he is in some way related to them, and possessed of an almost human spirit. Still, they do not scruple to kill him; but as soon as the breath is out of his body, they cut off his head, which they place ceremoniously within a mat decorated with a variety of ornaments. They then blow tobacco-smoke into the nostrils, and the chief hunter, praising his courage, and paying a variety of compliments to his surviving relatives, expresses regret at having been compelled to deprive him of life, and his hope that his own conduct has been altogether satisfactory to Mr Mooin, and worthy of the renown they have both attained.

The musquaw hibernates, like other bears of northern regions, and is very particular in selecting a dry cave for his long winter's nap. At the "fall," he is especially fat, having lived for some time on the beech-mast, blue-berries, and other fruits which grow in great profusion in the forest. He then weighs 500 pounds, and even 600 pounds. The chief part of the fat lies along the back, and on either side, as in the flitch of the hog. There is no doubt that it is by the absorption of this fat throughout his winter fast of four months that he is enabled to exist—at this time evaporation being at a stand-still. Having at length selected a cavern, or the hollow of a decayed tree, for his lair, he scrapes out all the dead leaves, till the ground is perfectly clean and smooth. It must be deep enough to prevent the snow from drifting into it, and free from any water trickling down from above. He objects especially to a habitation which has been occupied by the porcupine, that animal being far from cleanly in its habits. Perhaps also he has an objection to the quills with which the creature is furnished, from their being likely to produce disagreeable wounds. He forgets, perhaps, that the rubbish he has scraped out will betray his abode to the hunter—which it assuredly does. The Indian, on discovering this

indubitable sign of Mooin's abode, takes steps to arouse him and plant a bullet in his head, or to batter out his brains with his axe. Mooin, however, in spite of his usual sagacity, ignorant that his abode may be discovered, perhaps already overcome with a strange desire to sleep, crawls in for his winter's snooze. He is frequently accompanied by a partner, who will add to his warmth and comfort. He there lies down with his fore-paws curled round his head and nose, which he pokes underneath his chest. Here he remains asleep till the warm sun of March or April tempts him to crawl out in search of food to replenish his empty stomach and strengthen his weakened frame. Madam Mooin is generally, at this time, employed in the pleasing office of increasing her family. Her young cubs, when born, are curiously small, helpless little beings, not larger than rats. Generally there are two of them, and they are born about the middle of February. She manages to nourish them without taking any food herself till March or April, when she also, like her better half, sallies forth in search of provender. The young creatures grow but slowly, and do not attain their full size till they are about four years old. Even when about a couple of months old, the little cubs are not much larger than a retriever puppy of the same age.

The musquaw finds great difficulty at first in satisfying the cravings of his appetite. He searches for the cranberries in the open bogs, and is driven even to eat the rank marshy grass. As the snow disappears, he seeks for wood-lice and other creatures in rotten trunks. Hungry as he is, he labours very patiently for his food. The prehensile form of his lips enables him to pick up with wonderful dexterity even the smallest insect or berry. As the ice breaks up in the lakes, he proceeds thither to fish for smelts and other small fish, which he catches with wonderful dexterity with his paws, throwing them out rapidly behind him. When, however, pressed by hunger, and unable to obtain the smaller creatures for food, he will attack young deer if he can take them by surprise; but as he can seldom do this, he is often tempted into the neighbourhood of settlements. Here he lies in wait for the cattle as they wander through the woods to their spring pastures; and when once he has taken to this dangerous proceeding, he is said to continue it. On catching sight of a herd, should it not be accompanied by a human being, he drives the animals into some boggy swamp, and there singling out a victim, he jumps on its back, and deals it a few tremendous blows across the head and shoulders, till the poor animal becomes an easy prey. He then drags it off into the neighbouring wood, and devours it at his leisure. This habit is often the cause of his destruction. On any remainder of the

animal being found, the aggrieved settler sets off, rifle in hand and axe in his belt, to punish the aggressor. The bear, he well knows, will revisit the carcass. So cunning, however, is Bruin, and conscious of guilt, that he is constantly on the watch, as he returns, for an enemy. He creeps up, accordingly, looking on either side, his caution increasing as he approaches his prey. The hunter, therefore, to outwit him, seeks his trail in the direction in which he has retreated, and conceals himself near it, but at some distance from the carcass. He waits till the sun is setting, when he is almost sure to see the bear come tripping nimbly along, not yet thinking it necessary to employ caution. At this moment a rifle-bullet, placed in his head, deprives him of his intended feast and his life at the same time.

The black bear possesses wonderful strength—said to be fully equal to that of ten men. Experiments have been tried, in which so many persons have attempted to drag off a cask baited with molasses, or other sweet stuff, secured to a rope, when the bear has carried it away with perfect ease, in spite of their united efforts to draw it from him.

The most dangerous time to attack a she-bear is in the spring; when she is accompanied by her cubs. If she has time, she will lead them off to a place of safety; but if not, she will chase the intruder from her domains—and woe betide him if he cannot manage to escape her claws! Bears are easily taken in traps, baited with small bundles of sticks smeared with molasses. They are hunted in the "fall," when they have become fat with the ample supply of blue and whortle berries or beech-mast on which they have been feeding. To obtain the beech-mast, Bruin will frequently climb a tree, and sometimes, like the orang-outang of Eastern seas, will build a rough platform for himself among the upper branches, where he can lie concealed and munch his food at leisure. The most certain way to obtain the animal in this case is to cut down the tree and shoot him as he reaches the ground, for, as may be supposed, he is in no amiable mood when thus disturbed, and, unless speedily killed, would attempt to wreak a fearful vengeance on his assailants. The black bear springs on his prey in the same way as does the tiger or panther of the southern part of the continent. He thus frequently kills the young moose, though the full-grown animal is too active and powerful to be thus caught. He will even attack horses in the same way, though the latter animal often receives him with a furious kick.

In the summer, the black bears unite and hunt in gangs, making the forest resound with their fearful snarling and loud

moaning cries. They give warning to the hunter to pile fuel on his camp-fire, and to take his rifle in hand, for, strong in numbers, they will not hesitate to approach him, and, if pressed by hunger, to make an assault on his camp.

The Grizzly Bear.

The most dreaded inhabitant of the Rocky Mountains and their neighbourhood, is the savage grizzly, frequently called by the hunters Old Ephraim. Even the bravest hunter, when making his way through this wild region, finds it necessary to call all his courage and hardihood to his aid, when he sees one of these huge monsters sitting upon its hind-legs prepared for a rush towards him, and uttering a loud, harsh sound, like a person breathing quickly. Should he not wish for a contest, his best plan is to face the monster boldly, moving slowly on, but ever keeping his eyes fixed on the animal. The bear will, in most cases, after watching him attentively for some time, turn round and gallop off. If, however, he should lose his presence of mind, and attempt to fly—or should he fail, when he fires, to shoot the monster through the brain—in all probability he will quickly be torn to pieces.

The grizzly frequently attains a length of nine feet, and weighs from 700 to 800 pounds. His head, in proportion to his muzzle, is very large. He has a long, narrow muzzle, somewhat flattened, with large, powerful, canine teeth. His eyes are small, and deeply sunk in his head. His tail is so short, that it is completely concealed by the surrounding hair. He possesses remarkably long feet, which, in the full-grown animal, are eighteen inches in length; and they are armed with sharp and powerful claws five inches long, and so extremely sharp, that they cut into the flesh like knives. He can also use them separately like fingers, so that he can grasp a dry clod of earth and crumble it to dust as a human being could do with his hand. He can also, with them, dig into the ground; and when the weight of his body is not too great, they enable him to climb trees, although not with the speed of his black brother of the plains. As acorns form a portion of his food, it is said that he will climb a tree and shake the boughs vehemently to make them fall, when he descends and revels on the fruit his ingenuity has thus obtained. The hunter who has to fly for his life may however escape from a bear,—when the monster is filled out with autumn food, and cannot manage to raise his huge body from the ground,—by climbing a tree.

The grizzly varies much in colour. Sometimes his fur is of a dullish brown, freckled over with grizzly hairs; while other specimens are entirely of a steely grey. In all cases, the grizzly hairs give a somewhat white appearance to the surface of the fur. When the animal is young, his fur is of a rich brown, and often very long and thick, and much finer than that of the adult animal. When the creature walks, he swings his body in an odd fashion, rolling his head, at the same time, from side to side, which gives him a remarkably awkward look. Although the grizzly occasionally satisfies himself with vegetable diet, he will also attack and devour any animals he can kill. He does not hesitate to assault the powerful bison; and on overtaking a herd, he will spring without hesitation on the largest bull, and, with the tremendous strokes of his powerful paws, speedily bring it to the ground, when he will without difficulty drag the enormous carcass off to his lair, to devour it at his leisure. All other animals stand in awe of the grizzly; and even the largest pack of hungry wolves will not venture to attack him, nor indeed will they touch his carcass after he has succumbed to the rifle of the hunter. Horses especially are terror-stricken when they scent or see a grizzly; and not until they have been carefully trained, will they even allow the skin of one to be placed on their backs.

The grizzly employs his claws both in digging for roots and in burying any large animal he may have killed, to preserve the carcass till he requires it for another meal. An anecdote is given of a hunter who, pursued by one of these monsters, took advantage of this propensity to save his life. His rifle was unloaded. Of course he had not wounded the bear, or his stratagem would have been in vain. Throwing himself on the ground, the hunter closed his eyes, and stretching out his limbs, feigned to be dead. It must have been a fearful moment when he felt the bear lift up his body in his claws to carry him away to the neighbourhood of his lair. The bear having dug a hole, placed him in it, and covered him carefully with leaves, grass, and bushes. An Indian, or hardy backwoodsman, could alone have existed under such circumstances. The hunter waited anxiously till he heard loud snores proceeding from the cavern. Then, slipping up, like Jack the Giant-killer from the castle of the ogre, he scampered off as fast as his legs could carry him.

Mr Kane—the Canadian artist—mentions meeting a grizzly when in company with an old, experienced half-breed hunter, François by name. François, however, declined firing, alleging that the risk was greater than the honour to be obtained—his own character for bravery having been long established. Young

hunters might do so for the sake of proudly wearing the claws—one of the ornaments most esteemed by an Indian chief—round his neck. Although Kane's gun had two barrels, and François had his rifle, they knew it was ten chances to one they would not kill him in time to prevent a hand-to-hand encounter. The bear walked on, looking at them now and then, but seeming to treat them with contempt.

Some years before this, a party of ten Canadian voyageurs, on a trade excursion in the neighbourhood of the mountains, were quietly seated round a blazing fire, eating a hearty dinner of deer, when a large, half-famished bear cautiously approached the group from behind a chestnut-tree. Before they were aware of his presence, he sprang across the fire, seized one of the men, who had a well-finished bone in his hand, round the waist with his two fore-paws, and ran about fifty yards on his hind-legs with him before he stopped. The hunter's comrades were so thunderstruck at the unexpected appearance of such a visitor, and his sudden retreat with "pauvre" Louisson—the man who had been carried off—that they for some time lost all presence of mind, and, in a state of confusion, were running to and fro, each expecting in his turn to be kidnapped in a similar manner. At length Baptiste Le Blanc, a half-breed hunter, seized his gun, and was in the act of firing at the bear, when he was stopped by some of the others, who told him that he would inevitably kill their friend, owing to the position he was then in. During this parley, Bruin, relaxing his grasp of the captive, whom he kept securely under him, very leisurely began picking the bone the latter had dropped. Once or twice Louisson attempted to escape, which only caused the bear to watch him more closely. On his making another attempt, the bear again seized him round the waist, and commenced giving him one of those dreadful embraces which generally end in death. The poor fellow was now in great agony, and gave way to the most pitiful screams. Observing Baptiste with his gun ready, anxiously watching a safe opportunity to fire, he cried out, "Tire! tire! mon cher frère, si tu m'aimes! A la tête! à la tête!" This was enough for Le Blanc, who instantly let fire, and hit the bear over the right temple. He fell; and at the same moment dropped Louisson. He gave him an ugly claw along the face, however, which for some time afterwards spoiled his beauty. After he had tired, Le Blanc darted to his companion's side, and with his *couteau de chasse* quickly finished the sufferings of the man-stealer, and rescued his friend from impending death. On skinning the bear, scarcely any meat was found on his bones, showing that it was in a fit of hungry desperation that he had

thus made one of the boldest attempts at kidnapping overheard of in the legends of ursine courage.

Wolves.

There are several species of wolves in North America: one, a large, black animal, which inhabits the forests; and another, much smaller, which hunts the bison and deer in vast packs across the prairie, and is called the prairie-wolf. Like the wolf of Europe, the black wolf is a fierce, dangerous creature, and equally cowardly. When driven into the corner of a hut, as has sometimes occurred, or when caught in a trap, he will not attempt to defend himself against any person who may enter to destroy him. Audubon mentions an instance of this. A farmer with whom he was staying having lost a number of his animals by wolves, dug several pitfalls in the neighbourhood of his farm. Three large wolves were found in the morning in one of these traps. The farmer, instead of shooting them from above, boldly descended into the trap, and seizing the creatures one by one by the hind-legs, severed the chief tendon, thus preventing their escaping. He afterwards killed and skinned them at his leisure, their skins being of sufficient value to repay him for the loss of his cattle.

The prairie-wolves are considerably smaller than their brethren of the woods. They travel in large packs, a solitary one being seldom seen. Their skins are of no value. The Indians will not waste their powder upon them, and they therefore multiply so greatly, that some parts of the country are completely overrun by them. They are, however, caught by; pitfalls covered over with switches baited with meat. They destroy a great number of horses, particularly in the winter season, when the latter get entangled in the snow. In this situation, two or three wolves will often fasten on one animal, and speedily, with their long claws, tear it to pieces. The horses, however, often bravely defend themselves; and Mr Goss mentions finding near the bodies of two of these animals, which had been killed the night before, eight wolves lying dead and maimed around,—some with their brains scattered, and others with their legs or ribs broken.

Let us watch from an ambush the manoeuvres of a pack of savage cayotes—the name given to one species of wolf—while hunting their prey. Our ears are first assailed by a few shrill, currish barks at intervals, like the outpost firing of skirmishing parties. These are answered by similar barks from the opposite direction, till the sounds gradually approximate on the junction of the different bands. The horses, sensible of the approach of

danger, begin to paw the ground, snort, toss up their heads, look wildly about them, and exhibit other symptoms of fear. We prepare our guns ready for action. Three or four stallions take the lead, and wait, with comparative composure, for the approach of the enemy. The allies at length enter the field in a semicircular form, with their flanks extended, for the evident purpose of surrounding their prey.

They are between three and four hundred strong. The horses, from experience, know well their object, and, dreading an encounter with so numerous a force, instantly turn round and gallop off in a contrary direction. Their flight is the signal for the wolves to advance. The brutes, uttering a simultaneous yell, charge after the fugitives, still preserving their crescent form. Two or three horses, much out of condition, are quickly overtaken, when they commence kicking at the advance-guard of the enemy; but though several of the wolves receive severe blows, they will, it is evident—being reinforced by others—quickly despatch the unfortunate horses.

It is time for us to emerge from our concealment and fire a volley at the enemy's centre, by which several are brought down. The whole battalion of cowards instantly wheel about, and fly towards the hills in the utmost disorder; while the horses, hearing the sound, come galloping up to us for protection, and by their neighing express their joy and gratitude at our timely interference.

Lynxes.

Although lynxes are not so numerous in America as wolves, they are equally destructive, and individually more daring—attacking deer and smaller animals when they can take them at a disadvantage. They seldom fly, as wolves do, on the first approach of man. In size, the largest does not exceed the dimensions of an English mastiff. The Canadian lynx is frequently termed the Peeshoo, and sometimes "Le Chat" by the French Canadians. His coat is covered with long hairs of a dark grey hue, besprinkled with black, the extremities of which are white, with dark mottlings here and there on the back. Sometimes the fur is of a ruddy chestnut tinge, and the limbs are darker than the rest of the body—which is about three feet long. The animal possesses powerful limbs, and thick, heavy feet, furnished with strong, white claws. When moving over the ground it leaps in successive bounds, its back being slightly arched, and all its feet pitching at the same time. It also swims well, and can cross rivers and lakes a couple of miles broad.

Strong as it is, it appears it is easily killed by a blow on the back with a slight stick. It ranges throughout the greater part of the continent, and is shot or trapped for the sake of its fur, which is of considerable value.

The Wolverine, or Glutton.

The wolverene, or glutton, carries off the palm for cunning from all the other animals. It is also more ferocious and daring for its size than even the huge grizzly, while for voracity it is unsurpassed. In appearance, it is somewhat similar to a young bear. It is of a brownish-black colour, with a black muzzle and eyes of a dark hue, the space between them being of a brown tint. The paws are also quite black, contrasting with the ivory whiteness of the claws. It possesses large and expanded paws, to enable it to pass over frozen snow; indeed, so large are they, that its footsteps are often mistaken for the tracks of the bear. In one of its habits it resembles Mr Bruin, having the custom, when it finds an animal which it cannot devour at one meal, of carrying off the remainder and hiding it in some secure place.

The glutton moves at a somewhat slow pace, and appears rather deficient in agility; but at the same time he is persevering and determined, and will range over a wide extent of country in search of weak or dying animals, stealing unawares upon hares and birds, etcetera. When he takes a fancy to some larger quadruped as it lies asleep, he springs upon it, tearing open the neck and throat. He is supposed to prefer putrid flesh, and the odour which proceeds from him would lead us to suppose that such is the case. The trappers look upon him with especial hatred, as, with his usual cunning, he seeks out their hoards of provisions in *cache*, and destroys their marten-traps. He himself is so sly that he is seldom caught in a snare. When he finds one, he approaches it from behind, and pulling it to pieces from the outside, carries off the bait. The marten-hunter will go forth and set a line of traps, extending to upwards of forty miles in length or circumference. The wolverene, observing what he is about, follows at a distance, carefully pulling the traps to pieces as he leaves them behind, and eating off the heads of the partridges or other birds which have been used as bait, declining all the time to run his nose into danger. When a sable or marten is entrapped, he tears out the dead animal and carries it away. It is even supposed that he will attack a hibernating bear in his den, and manage to kill him before Bruin has aroused himself sufficiently for his defence.

The wolverene is the fur-trapper's greatest foe, and, as may be supposed, he has no mercy shown him. The cunning creature, moreover, in spite of his cleverness, sometimes gets caught. Mr Paul Kane, in one of his journeys across the country, had left a *cache* composed of logs built together, something like a log-house, but not very closely fitted. Impelled by hunger after a long journey, he and his companion on their way back reached their *cache*, and began throwing off the heavy logs which covered the top and concealed it. The Indian, hearing a great disturbance within, called to Mr Kane to fetch the guns. Just as he got up, a fine fat wolverene jumped out, but was immediately shot down. The creature must have been starved and desperately thin to have squeezed himself through the openings between the logs, and no doubt, impelled by hunger and the smell of the meat inside, had not thought much of a slight squeeze. When, however, he was once in, and had enjoyed a few good meals, he could not get out again, and the idea of starving himself as long as the meat lasted did not appear to have occurred to him.

The disappointment to the hungry travellers was very great, as but little food was left, and that was mangled, torn, and tossed about in the dirt by the animal.

The Raccoon.

To obtain a satisfactory sight of the raccoon, we must set out into the forest by torchlight, accompanied by dogs, with fowling-piece in hand. As he remains during the day in some hollow tree, it is rarely we can get a good view of him. Even if by chance found on the ground, he ascends the tree so rapidly, that he is stowed away before our rifle can reach the shoulder. The well-trained dog, however, quickly finds him when roving about the woods at night.

Let us accompany Audubon on a 'coon hunt. Our native companions have gone before with the dogs, who are baying at the raccoon in an open part of the forest. On our coming up, a singular scene presents itself to us. The flare of our torch seems to distress him. His coat is ruffled, and his rounded tail seems thrice its ordinary size. His eyes shine like emeralds. With foaming jaws he watches the dogs, ready to seize by the snout each who comes within reach. His guttural growlings, instead of intimidating his assailants, excite them the more. He seizes one, however, by the lip. It is a dangerous proceeding, for, while thus far victorious, the other curs attack him in flank and rear, while their companion yells pitifully. The raccoon will not let go,

but the other dogs, seizing him fast, worry him to death. Yet to the last he holds tightly the dog's lip.

While we stand gazing at the poor animal, all around is, by the flare of the torch, rendered trebly dark and dismal. It is a scene for a skilful painter.

The raccoon is about the same size as a small fox, and though somewhat like it, has also rather an ursine appearance. He has a tufted tail marked with black and white bands. The head tapers somewhat like that of the fox, but the ears are short and slightly rounded, the forehead broad, and the nose sharp. The fore-legs being shorter than the hinder, when he stands the tail end of his body is lifted higher than the front, and consequently his back appears curved. He walks like the dog, putting the tips of his toes to the ground; but when he stops he lays his feet flat.

He receives no mercy from the farmers, for he is of a sanguinary and savage disposition, and commits great havoc among domestic as well as wild birds, always destroying far more than he requires; merely eating off their heads, or lapping up the blood which flows from their wounds. He commits occasionally ravages in sugar-cane or Indian-corn plantations; and, climbing with ease, catches birds, and devours their eggs. He resembles the squirrel in his movements; and, like that animal, when eating, sits on his hind-legs, and uses his fore-feet to carry his food to his mouth. A story is told of a young tame raccoon let loose in a poultry-yard, when, his natural disposition overcoming his civilised manners, he sprang on a cock strutting in a dignified fashion among the hens, and fixed himself on its back. The bird, surprised at so unusual an attack, began scampering round the yard, the hens scattering far and wide in the utmost confusion. Still the little animal kept his seat, till he managed to get hold of the unfortunate cock's head in his jaws, and before the bird could be rescued, had crunched it up—still keeping his seat, in spite of the dying struggles of his victim; and probably, had he not been bagged, would have treated all the feathered inhabitants of the yard in the same fashion. When out hunting on his own account, he often hides himself among the long reeds on the bank of a lake or stream, and pouncing out on the wild ducks as they swim incautiously by, treats them as he does the domestic fowls on shore.

He partakes considerably of the cunning of the fox, yet, like that animal, is frequently outwitted. A raccoon after a long chase managed to reach a tree, which he quickly climbed, with the aid of his claws, snugly ensconcing himself in the deserted nest of a

crow. In vain the hunters sought for him, till his long, annulated tail, which he had forgotten to coil up within the nest, was seen pendent below it; and the poor raccoon was quickly brought to the ground by a rifle ball.

He has gained the name of the *lotor*, or the washer, in consequence of his habit of plunging his dry food into water before eating it. He also drinks a large quantity of water. When moistening his food, he grasps it with both his fore-paws, moving it violently backwards and forwards, as a person does washing clothes in a stream. The German naturalists call him the washing-bear. Though savage and bloodthirsty in his wild state, he is frequently tamed; but he is somewhat capricious in temper, and not easily reconciled when offended. It is curious that he should, when domesticated, change his usual custom of sleeping in the daytime and wandering about at night; but this he does, remaining quiet all night, and making his appearance among the inmates of the house as soon as the sun sheds its light abroad. Though in his wild state a fit member for a temperance society, he will when in captivity, as if to recompense himself for his hard lot, drink fermented liquors of all sorts—the stronger and sweeter the better. An old writer on American animals says, in reference to this propensity, that if taken young it is easily made tame, but “is the drunkenest creature alive, if he can get any liquor that is sweet and strong.” The same writer states that the cunning raccoon often catches crabs by inserting one of his feet into their holes, and dragging them out as soon as they seize hold of it.

The Agouaha, or Crab-Eating Raccoon.

In the Southern States we find another species of raccoon, somewhat larger than the former, who is addicted to eating molluscs and crustaceans, whether marine or terrestrial. It is said, also, that when other means fail of obtaining food, he seats himself on a branch hanging low down over some quiet pool, and using his flexible tail as a fishing-line, waits patiently till its end is caught hold of by a snapping turtle or other inhabitant of the water, when, whisking it up, he tears open the creature's shell and devours the luscious flesh with aldermanic relish. The fur is generally of a blackish-grey hue, washed with a tinge of yellow. A blacker tint prevails on the head, neck, and along the spine. His tail, in proportion to the size of his body, is shorter than that of the common raccoon, and is marked with six black rings, upon a blackish-yellow ground.

The Ermine.

When we see the judge seated in his richly trimmed robe of ermine—emblem of purity—or call to mind the regal robes of a proud monarch, we are apt to forget that the fur which we so much admire is but that of the detested stoat, turned white during his abode amid the winter's snow of a northern clime. He is not unlike the weasel, especially when clothed in his darker summer dress, but with a less ruddy hue. The edges of the ears and the toes always remain white.

He is considerably larger than the weasel, measuring upwards of fourteen inches, including the tail—which is about four inches long, the tip almost black. He is a bold hunter, and follows and destroys the hare, and other animals of equal size. It is said, even, that several together will venture to attack a man. They are caught in America by traps, which, giving the animal a sudden blow, kill it without injuring the skin.

The winter coat of the ermine is produced by the whitening of the fur, and not, as was once supposed, by the substitution of white for dark hairs. Probably one cause of this change of hue may be that the energies of the creature concentrate themselves on the vital organs, to enable it to resist the extreme low temperature of the icy regions it inhabits, and cannot thus spare a sufficient amount of blood for the formation of the colouring matter which tinges the hair. Human beings as well as animals become weaker as they increase in age; and it has been observed that their hair also loses its colour, in consequence of such energies as they possess being required to assist the more important functions of nature. This corroborates the correctness of the former remark.

The ermine, like other species of its genus, has the faculty of ejecting a fluid of a strong musky odour. It is abundant, not only in the barren grounds of the Hudson Bay territories, but is also found in Norway and Siberia.

When the fur is used for robes, or similar purposes, the black tuft at the end of the tail is sewn on at regular distances to the skin, giving to the ermine fur the appearance we are all familiar with.

The Pine-Marten.

The pine-marten, a species of weasel, obtains its name from being found amid pine-forests, and from its habit of climbing the trunks of pines in search of prey. It is a fierce and savage creature, choosing to live alone, away from the haunts of man.

It is from eighteen to twenty inches in length—with a tail measuring about ten inches—and is covered with long bushy hair. Moving without difficulty among the branches, it seizes many an unfortunate bird in its deadly gripe before its victim can take to flight—robbing also the nest of the eggs within it.

It is common in Europe, as well as in America; but in the cold regions of the Hudson Bay Company it is hunted for the sake of its skin, which is, when blanched during the winter's cold, scarcely inferior to that of the celebrated sable.

When pursued and overtaken, it stands at bay, exhibiting its teeth, erecting its hair, arching its back, and hissing like a cat. It forms its burrows in the ground, the female producing, a litter of from four to seven. Like other animals of its tribe, it emits a peculiar musky smell.

The Otter.

In winter, along the steep banks of the frozen streams, smooth and shining tracks may be readily detected. They are produced by otters, which have a curious habit of sliding downwards for their amusement—much as human beings are accustomed to do in Canada in their toboggans. To do this, they lie on their bellies, with their fore-legs bent backwards, and giving themselves an impetus with their hind-legs, down they glide, at a swift rate, upon the ice. This sport they will continue for some time, climbing up again to the top of the bank, and repeating the process over and over again. They are also accustomed to pass through the woods from lake to lake, making a direct track in the snow. These tracks are easily known. Then comes a broad trail, as if made by a cart-wheel. This is formed by the animal throwing itself on its belly, and thus sliding along over the surface for several yards. These places are called "otter rubs."

There are two species of otter in North America—one on the east, and the other on the Pacific slope—differing slightly from each other. The former is considerably larger than that of the Old World, measuring, from the nose to the tip of the tail, sometimes from four and a half to five feet. Like most other water animals, it possesses two sorts of hair: the one is long and shining, and of a rich brown colour, except on the throat, which is of a dusky white; the other is very fine and soft, lying next the skin, and serving to protect it from the extremes of heat and cold. It has excessively sharp, short teeth, which enable it to hold fast the fish, on which it chiefly feeds. Its body

is elongated and much flattened, and the tail, which is of great length, is also flat and broad. The legs are short and strong, and so loosely jointed that it can turn them in any direction when swimming.

The habitations of otters are formed in the banks of rivers or lakes, and are not altogether of an artificial character, as they prefer occupying any deserted hollow or natural crevice to the trouble of digging burrows for themselves. Though they are very playful animals, and delight apparently in sport, they are somewhat of a savage disposition, and must be taken very young to be domesticated. They are cautious, timid animals, and can seldom be approached unawares. They eat all sorts of fresh-water fish, such as trout, perch, eels, and suckers; and will also devour frogs. Occasionally they may be observed on a rocky islet of some lone stream, resting after a banquet, or about to plunge into the water in chase of one of the finny tribe, which their keen eyes detect swimming by. They are trapped, in Canada, by steel traps, which are submerged close to the bank below their "rubs." They make a peculiar whistling sound, which the Indian can imitate perfectly, and thus frequently induces them to approach. Their skins are manufactured into muffs and trimmings and caps, such as are usually worn in winter by Canadians.

An otter, when attacked, will defend itself with desperation, snapping furiously at the Indian, and then shaking its head violently as a dog does when destroying a rat. Their bite is severe—sufficient indeed to snap off a man's finger—and when once its jaws are closed, no power is capable of making it relinquish its grasp. The Canadians do not attempt to tame the otter; but the persevering Chinese not only contrive to domesticate the species found in their country, but teach them to capture fish for their benefit.

The Skunk.

Rambling amid the woods, even in the neighbourhood of settlements, we may occasionally come upon a curious little animal, with a party-coloured coat and bushy tail, and an amiable and gentle appearance. The creature appears to be in no way timid, and will very likely await our approach. As we draw near it, however, it is apt to turn round and erect its bushy tail perpendicularly. Let us beware of what we are about, for, in a moment, the creature may send over us a shower of a substance so horribly odious, that not only may we be blinded

and sickened by the effluvium, but our clothes will be made useless, from the difficulty of getting rid of the odour.

The creature is the skunk, and is about the size of a cat. It possesses short round ears, black cheeks, and a white stripe extending from the nose to the back. The upper part of the neck and the whole back are white, divided by a black line. Below, it is black, as are the legs; and it has a full tail of coarse black hair, occasionally tipped with white. Its legs are short, and it does not possess much activity. Its feet are armed with claws, somewhat like those of the badger.

It appears to use this horrid effluvium—which is generated in glands near the tail—as a means of defence. All other animals have a due horror of it. Anything which it touches is tainted: provisions are destroyed; and clothes, though often washed, will retain the smell for many weeks. At one time this substance was used for medicinal purposes. The mode of defence bestowed on the skunk is somewhat similar to that employed by the cuttle-fish, which emits a dark liquor when pursued. Those who have once smelt the horribly fetid odour of the skunk will not easily forget it.

The Pekan, or Wood-Shock.

Still keeping to the lakes and streams, we may often fall in with a creature of curious habits, which, unlike those just described, lives almost entirely among the branches of the trees. In shape it is somewhat like a weasel, and is the largest of the tree martens. It is known as the wood-shock or pekan, and is also called the black cat, and fisher. This last term is inappropriate, as it is not in any way piscivorous. It is of a dark brown hue, with a line of black shining hair reaching from the neck to the extremity of the tail. The under parts are lighter; some entirely white. It possesses also a very large, full, and expressive eye.

Though spending its time among the trees, hunting for its prey, it forms a burrow in the ground for its usual habitation. It lives upon squirrels and rabbits, as well as grouse and other birds and their eggs. Not only does it venture to attack the well-armed porcupine, but it kills the animal, and eats it up, quills and all. The difficulty of accomplishing this appears very great, but there are numerous instances in which pekans have been killed, when their bodies were found full of quills, from which they did not appear to have suffered. They eat up, indeed, both the flesh and bones of the porcupine—the latter being so strong that a small bird cannot crack them. Mr Downs, the naturalist of

Nova Scotia, states that he has frequently found porcupine quills in the stomach of the fisher.

The animal is hunted for the sake of its skin, which is of some value—as also for amusement, especially by boys, as the creature is not sufficiently formidable to cause any great danger to them or their dogs. It is about four feet long, including the tail, which measures about eighteen inches.

The Mink.

Another denizen on the shores of the fresh-waters of Canada is the mink, called also the smaller otter, and sometimes known as the water pole-cat. It may be seen swimming about the lakes, preferring generally the still waters in autumn to the more rapidly-flowing currents of spring. It somewhat resembles the otter, and differs in shape slightly from the marten or ferret. Its teeth, however, are more like those of the pole-cat than the otter; while its tail does not possess the muscular power of the latter animal.

Like the otter, it lives upon fish and frogs, but will occasionally make a marauding expedition into poultry-yards. Its general colour is a dark reddish-brown, approaching in some specimens almost to black on the head; while there is a patch of white, varying in size, under the chin. It is trapped by the settlers both in self-defence and on account of its fur, which is of considerable value, and greatly resembles sable—a good skin often fetching four or five dollars.

Marsupials, or Pouched Animals:—The Virginian or Common Opossum.

The opossum, with its prehensile tail, marsupial pouch, and cunning ways, stands alone for its singularity among all the animals of the American continent. Many of the tribe are found in South America; but the Virginian opossum, the size of a full-grown cat, is larger than all its relatives. The head and body measure about twenty-two inches; and the tail, fifteen. It is covered with a light grey hair of wool-like softness, short on the face and body, but long on the legs. The base end of the tail is thick and black, and is covered with small scales. So powerful is this member that the opossum can hold on with it to the bough of a tree, and even when desperately wounded it does not let go. Its face is long and sharpened, the mouth very determined, and armed with numerous sharp teeth. It has thin, naked, round, and blackish ears, edged with a border of white. It has

short legs, the feet being armed with claws, and the interior toes of the hind-feet are flat and rounded.

It has the power of emitting a disagreeable odour when chased or alarmed. When pursued, it makes for the nearest tree; and should it discover the approach of a hunter and his dogs when already up a tree, instead of taking to flight, it lies close along the branch, endeavouring to hide itself. When moving amidst the boughs, it swings itself from branch to branch by means of its tail; and it may be observed at times hanging down, with its eyes wide open, on the look-out for any birds which may incautiously alight on the bough above, or pass within its grasp.

It is very voracious, feeding on small quadrupeds and birds of all sorts; while it does not disdain to prey off a brood of young cotton rats and mice, and devours insects and a variety of reptiles. When unable to find sufficient food in the forest, or too lazy to look for it, it will, without hesitation, make a raid into the farmer's poultry-yard, and carry off or kill his fowls, and eat up any eggs it may find. The opossum does not always indulge in animal diet,—for he climbs fruit-trees to carry off their luscious productions; and for the sake of obtaining maize, of which he is especially fond, he will climb the tallest stems, and bite them across, so as to bring the heavy ear to the ground. He will also clamber to some higher branch, and hang down, in search of the fruit growing on the boughs incapable of bearing his weight.

The quality for which he is chiefly noted is his habit of feigning death. Frequently he is brought to the ground, when there he lies, every limb relaxed, evidently as dead as can be. The knowing hunter will, however, keep his glance on the creature. If he withdraws it for a moment, its eyelids will be seen slowly opening; and should he turn his head for even the shortest space, the creature will be on its feet, stealing away through the underwood. Though so perfectly an adept at "possuming," before attempting to practise its usual ruse it will make every effort to escape from its pursuers. When chased alone by a dog, it will content itself by scrambling up a tree, and sitting quietly on a branch, out of reach, looking down on its canine assailant with contempt as it runs barking furiously below it. The opossum is thus said to be "treed;" and before long, the barking of the dog brings his master to the spot, when the opossum has to fly for its life to the highest branch it can reach. It is easily captured by the rudest style of trap, into which it will walk without hesitation. When "feigning 'possum," it will submit to be knocked about, and kicked and cuffed, without giving the slightest sign of life. The flesh of the opossum is white, and

considered excellent—especially in the autumn, when, after feeding amply on the fruits, beech-nuts, and wild berries, of which it is especially fond, it is very fat.

The female opossum builds a warm nest of dry leaves and moss, sometimes in the hollow of a rotten tree, or beneath its wide-spreading roots. She has been known occasionally to take possession of a squirrel's nest; and at other times, that of the Florida rat. When her young—generally thirteen to fifteen appearing at a time—are born, they are extremely small—not an inch in length, including the tail—and weighing only four grains. After a couple of weeks or so, she places them in her pouch, when they grow in size and strength, and in about four weeks may be seen with their heads poked out surveying the world, into which they begin to wander at the end of five or six weeks. When first-born, they are the most helpless of little creatures, being both deaf and blind.

The larger number of opossums, however, are to be found in South America, where we shall have an opportunity of further examining them.

Part 1—Chapter VIII.

The Feathered Tribes of North America.

The Bald or White-Headed Eagle.

The white-headed eagle takes precedence among the feathered tribes of America,—because he stands first in natural order, and has been selected by the people of the United States as their heraldic emblem. Their choice was, by-the-by, objected to by Benjamin Franklin, on the plea “that it is a bird of bad moral character, and does not get his living honestly.” There was justice in the remark, for the bald eagle is a determined robber, and a perfect tyrant. He is, however, a magnificent bird, when seen with wings expanded, nearly eight feet from tip to tip—and a body three and a half feet in length—his snowy-white head and neck shining in the sun, and his large, hooked, yellow beak open as he espies, afar off, the fish-hawk emerging from the ocean with his struggling prey. Downward he pounces with rapid flight. The fish-hawk sees his enemy approaching, and attempts to escape; but, laden with the fish he has just captured, in spite of the various evolutions he performs, he is

soon overtaken by the savage freebooter. With a scream of despair he drops the fish.

The eagle poises himself for a moment, as if to take more certain aim, then, descending like a whirlwind, snatches it ere it reaches the water.

The plumage of the bald eagle is of a chocolate-brown, inclining to black along the back, while the bill and upper tail-coverts are of the same white hue as the head and neck. He and his mate build their nest in some lofty tree amid a swamp; and repairing it every season, it becomes of great size. Its position is generally known by the offensive odour arising from the number of fish scattered around, which they have let drop after their predatory excursions. The nest is roughly formed of large sticks, moss, roots, and tufts of grass. They commence making fresh additions to their nest early in the year; and the female deposits her eggs in January, and hatches the young by the middle of the following month. Robbers as they are, the white-headed eagles exhibit great parental affection, tending their young as long as they are helpless and unfledged; nor will they forsake them even should the tree in which their nest is built be surrounded by flames. Wilson, the American naturalist, mentions seeing a tree cut down in order to obtain an eagle's nest. The parent birds continued flying clamorously round, and could with difficulty be driven away from the bodies of their fledgelings, killed by the fall of the lofty pine.

Audubon gives us an account of a savage attack he once witnessed made by an eagle and his mate on a swan:—The fierce eagle, having marked the snow-white bird as his prey, summons his companion. As the swan is passing near the dreaded pair, the eagle, in preparation for the chase, starts from his perch on a tall pine, with an awful scream, that to the swan brings more terror than, the report of the largest duck-gun. Now is the moment to witness the display of the eagle's power. He glides through the air like a falling star, and comes upon the timorous quarry, which now, in agony and despair, seeks by varied manoeuvres to elude the grasp of his cruel talons. Now it mounts, now doubles, and would willingly plunge into the stream, were it not prevented by the eagle, who, knowing that by such a stratagem the swan might escape him, forces it to remain in the air by his attempts to strike it with his talons from beneath. The swan has already become much weakened, and its strength fails at sight of the courage and swiftness of its antagonist. At one moment it seems about to escape, when the ferocious eagle strikes with his talons the

under side of its wing, and with an unresisted power forces the bird to fall in a slanting direction upon the nearest shore. Pouncing downwards, the eagle is soon joined by his mate, when they turn the body of the luckless swan upwards, and tear it open with their talons.

Along all the coasts of North America, as also at the mouths of the chief rivers, the white-headed eagle is found watching for his prey. An instance is mentioned of one of these savage birds being entrapped, and falling a victim to his voracity. Having pursued a wild duck to a piece of freshly-formed ice, he pitched upon it, and began tearing his prey to pieces, when the mass on which he stood continuing to freeze, his feet became fixed in the ice. Having vainly endeavoured with his powerful wings to rise in the air, he ultimately perished miserably.

The Wild Turkey.

The wild turkey, acknowledged to be the finest of game-birds, ranges throughout the forests of the more temperate portions of America. It is the parent of the valued inhabitant of our poultry-yards; and in its wild state utters the same curious sounds which it does in captivity. This superb bird measures about four feet in length. Its plumage, banded with black, gleams with a golden brown hue, shot with green, violet, and blue. Its head is somewhat small, and a portion of its neck is covered with a naked warty bluish skin, which hangs in wattles from the base of the bill, forming a long fleshy protuberance, with hairs at the top.

The bird, in the States, is commonly known as Bubbling Jock, and is called "Oocoocoo" by the Indians. The female builds her nest in some dry, secluded spot, guarding it carefully, and never approaching it by the same path twice in succession. When first her young are hatched, she leads them through the woods, but returns at night to her nest. After a time she takes them to a greater distance, and nestles them in some secluded spot on the ground. At this time they are frequently attacked by the lynxes, who spring upon them, knocking them over with their paws.

The wild turkey wanders to a great distance from the place of its birth. "About the beginning of October the male birds assemble in flocks," says Audubon, "and move towards the rich bottom-lands of the Ohio and Mississippi. The females advance singly, each with its brood of young, then about two-thirds grown, or in union with other families, forming parties often

amounting to seventy or eighty individuals—shunning the old cocks, who, when the young birds have attained this size, will fight with, and often destroy them by repeated blows on the head. When they come upon a river, they betake themselves to the highest eminence, and often remain there a whole day; for the purpose of consultation, it would seem, the males gobbling, calling, and making much ado,—strutting about as if to raise their courage to a pitch befitting the emergency. At length, when all around is quiet, the whole party mount to the tops of the most lofty trees, whence, at a signal—consisting of a single cluck—given by the leader, the flock takes flight for the opposite shore. On reaching it, after crossing a broad stream, they appear totally bewildered, and easily fall a prey to the hunter, who is on the watch for them with his dogs.”

The Ocellated Turkey.

A still more magnificent species of turkey than the one just described inhabits Honduras. It may be distinguished from the common turkey by the eye-like marks on the tail and upper wing-coverts. The naked skin of the head and neck, too, is of a delicate violet-blue, covered with numerous pea-looking knobs arranged in a cluster upon the crown. This is of a pale buff-orange, while there is a row of similar marks over the eye, and others scattered about the neck. The wattle hanging from the neck is of a light orange at the tip. The greater wing-coverts are of a rich chestnut, the feet and legs being of a lake colour. It is somewhat smaller than the wild turkey of the States.

The Canvas-Back Duck.

The celebrated canvas-back duck, allied to the English pochard, makes its appearance among the numerous rivers in the neighbourhood of Chesapeake Bay about the middle of October, as well as in other parts of the Union. It is at that time, however, thin; but soon grows fat, from the abundance of its favourite food. It is from two to three feet across the wings. Its glossy black beak is large. The head and part of the neck are of a rich glossy reddish-chestnut tint, with black breast. The wing-coverts are grey, and the rest of the body white, marked with a number of transverse wavy lines.

It is especially esteemed at table—and those who have eaten it at the hospitable boards of Americans will acknowledge its excellence; though when, on several occasions, some braces of these birds have been sent to England, they have failed to elicit

the admiration due to their merits—in consequence, it is said, of not being accompanied by an American cook.

The Summer Duck.

The most beautiful of the duck tribe which visits the States is the summer or tree duck of Carolina. It bears a strong resemblance in plumage and habits to the celebrated mandarin duck of China. The birds are found perching on the branches of trees overhanging ponds and streams—a habit not usual in the duck tribe—where they may be seen, generally a couple together, the male in his superb garments of green, purple, chestnut, and white, contrasting with the homely plumage of his mate.

The Pinnated Grouse, or Prairie Hen.

On the open “barrens,” where a few tufts of stunted brushwood are alone found, the remarkable pinnated grouse may be seen in great numbers running over the ground. Their backs are mottled with black, white, and chestnut-brown; and the male has two finely ornamented feathers on the neck, streaked with black and brown. It has also a slight crest on the head, of orange colour, hanging over each eye in a semicircular form; and naked appendages, which hang down from each side of the neck, and can be filled at the will of the bird by air, so that when puffed out they are like two small yellow oranges. As the breeding season approaches the males appear, uttering strange cries, puffing out these wattles, ruffling their feathers, and erecting their neck-tufts, as if wishing to appear to the greatest advantage before their mates. They occasionally engage in combats with each other, but their encounters are not often of a bloody description.

They form their nests rudely of grass and leaves, under the shelter of a bush or thick tuft of long grass. The hen lays about fifteen eggs of a brownish-white colour.

The most remarkable feature in the history of these birds is the way in which they assemble, as winter approaches, in vast numbers, to obtain protection from the biting force of the north-west winds which sweep over the Missouri country, by huddling close together.

“As evening draws near,” says Mr Webber, who has observed their habits, “they approach the spot they have fixed on, in the usual manner, by short flights, with none of that whirring of

wings for which they are noted when suddenly put up; but they make ample amends for their previous silence when they arrive. From the pigeon-roost there is a continuous roar, caused by the restless shifting of the birds, and sounds of impatient struggling, which can be distinctly heard for several miles. The numbers collected are incalculably immense, since the space occupied extends sometimes for a mile in length, with a breadth determined by the character of the ground. The noise begins to subside a few hours after dark. The birds have now arranged themselves for the night, nestled as close as they can be wedged, every bird with his breast turned to the quarter in which the wind may be prevailing. This scene is one of the most curious that can be imagined, especially when we have the moonlight to contrast with their dark backs. At this time they may be killed by cart-loads, as only those in the immediate neighbourhood of the slain are apparently disturbed. They rise to the height of a few feet, with a stupified and aimless fluttering, and plunge into the snow within a short distance, where they are easily taken by the hand. They will, if disturbed when they first arrive at a resting-place, change it; but after the heavy snows have fallen, they are not easily driven away by any degree of persecution. By melting the snow with the heat of their bodies, and by trampling it down, they then form a kind of sheltering-yard, the outside walls of which defend them against the winds."

They have, besides human foes, numberless enemies among the foxes, wolves, hawks, and other birds. The fecundity of the survivors, however, keeps pace with the many fatalities to which they are liable.

The Ruffed Grouse, or American Pheasant.

"This elegant species," writes Wilson, "is known throughout North America. Its favourite places of resort are high mountains, covered with the balsam-pine and hemlock." It prefers the woods—being seldom or never found in open plains. They are solitary birds; generally being seen in coveys of four or five, and often singly, or in pairs.

The stranger wandering through the forest is surprised to hear a peculiar sound, very similar to that produced by striking two full-blown ox-bladders together, but much louder. It is caused by the ruffed grouse, who, amusing himself by drumming, is little aware that it will bring the cruel sportsman towards him. The bird produces it when standing on an old prostrate log. He lowers his wings, erects his expanded tail, and inflates his whole

body something in the manner of the turkey-cock, strutting and wheeling about with great stateliness. After a few manoeuvres of this kind he begins to strike with his stiffened wings, in short and quick strokes, which become more and more rapid, till they run into each other. The sound then resembles the rumbling of distant thunder, dying away gradually on the ear.

The hen is an affectionate mother, and takes every means, when a stranger approaches her nest, to lead him away from the spot.

Wilson describes observing a hen-pheasant depart from this usual custom. He came suddenly upon one with a young bird in her company. The mother fluttered before him for a short time, when suddenly darting towards the young one, she seized it in her bill, and flew off along the surface of the ground through the woods, with great steadiness and rapidity, till she was beyond his sight, leaving him in much surprise at the incident. He searched round, but could find no other birds.

Here was a striking instance of something more than "blind instinct"—by the adoption of the most simple and effectual means for the preservation of her solitary young one—in this remarkable deviation from the usual manoeuvres of the bird when she has a numerous brood.

The ruffed grouse is of a rich chestnut-brown, mottled with brown and grey; while on each shoulder are the curious ruffs, or tufts, from which he obtains his name, of a rich velvety black, glossed with green. The skin beneath them is bare; the tail is grey, barred with blackish-brown.

Another species of grouse, smaller than the two former, inhabits Canada.

Passenger-Pigeons.

Flights of locusts are often seen passing through the air, like vast clouds, obscuring the sky. The passenger-pigeon of America appears in almost equal numbers. The accounts of their vast numbers would be incredible, were they not thoroughly well authenticated.

They are beautiful birds; the males being about sixteen inches in length, the females slightly smaller, and usually of less attractive plumage. The head, part of the neck, and chin of the male bird, are of a slaty-blue colour; the lower portions being

also of a slate colour, banded with gold, green, and purplish-crimson, changing as the bird moves here and there. Reddish-hazel feathers cover the throat and breast, while the upper tail-coverts and back are of a dark slaty-blue. Their other feathers are black, edged with white; and the lower part of the breast and abdomen are purplish-red and white. The beak is black, and the eyes of a fiery orange hue, with a naked space round them of purplish-red.

Its chief food is the beech-mast; but it also lives on acorns, and grain of all sorts—especially rice. It is calculated that each bird eats half a pint of food in the day; and when we recollect their numbers, we may conceive what an immense amount must be consumed.

The female hatches only one bird at a time, in a nest slightly made of a few twigs, loosely woven into a sort of platform. Upwards of one hundred nests have been found in one tree, with a single egg in each of them; but there are probably two or three broods in the season. In a short time the young become very plump, and so fat, that they are occasionally melted down for the sake of their fat alone. They choose particular places for roosting—generally amid a grove of the oldest and largest trees in the neighbourhood.

Wilson, Audubon, and other naturalists, give us vivid descriptions of the enormous flights of these birds. Let us watch with Audubon in the neighbourhood of one of their curious roosting-places. We now catch sight of a flight of the birds moving with great steadiness and rapidity, at a height out of gunshot, in several strata deep, and close together. From right to left, far as the eye can reach, the breadth of this vast procession extends, teeming everywhere, equally crowded. An hour passes, and they rather increase in numbers and rapidity of flight. The leaders of this vast body sometimes vary their course, now forming a large band of more than a mile in

diameter; those behind tracing the exact route of their predecessors. Now they once more change their direction—the column becoming an immense front, sweeping the heavens in one vast and infinitely extended line. Suddenly a hawk makes a sweep on a particular part of the column, when almost as quick as lightning that part shoots downwards out of the common track; but soon again rising, advances at the same rate as before.

We will now hurry on towards their breeding place, a forest on the banks of the Green River in Kentucky, fully forty miles in

length, and more than three in width. In the neighbourhood are assembled a large number of persons, with horses, waggons, guns, and ammunition; and a farmer has brought three hundred hogs to be fattened on the refuse pigeons. As the vast flight arrives at the spot, thousands are knocked down by men with long poles. Some place pots of sulphur under the trees; others are provided with torches of pine-knots; and the rest have guns. The birds continue to pour in. The fires are lighted; and a magnificent, as well as almost terrifying, sight presents itself. The pigeons arrive by thousands, alighting everywhere, one above another, till solid masses, as large as hogsheads, are formed on the branches all around. Here and there the perches give way with a crash, and falling to the ground, destroy hundreds of the birds beneath, forcing down the dense groups with which every stick is loaded. The pigeons continue coming, and it is past midnight before there is any sign of a decrease in their numbers. The ground in all directions is strewed with branches broken by the weight of the birds which have pitched on them. By sunrise, the enormous multitude have taken their departure, while wolves, foxes, and other animals who had assembled to feast on the bodies of the slain, are seen sneaking off.

Audubon describes the flight of one of these almost solid masses of birds pursued by a hawk; now darting compactly in undulating and angular lines, now descending close to the earth, and with inconceivable velocity mounting perpendicularly, so as to resemble a vast column, and then wheeling and twisting within their continued lines, resembling the coils of a gigantic serpent. Their assemblages greatly surpass in numbers those of the pinnated grouse already described.

Humming-Birds.

A considerable number of these gem-like members of the feathered tribe make their appearance in summer, even as far north as Canada, and on the sides of the hills rising out of the "Fertile Belt," within sight of Lake Winnipeg,—a region where snow covers the ground for so many months in the year. The most common, as well as the most beautiful, species of these minute birds, is the ruby-throated humming-bird—a name given to it on account of the delicate metallic feathers which glow with ruby lustre on its throat, gleaming in the sunshine like gems of living fire. From the tip of the bill to that of the tail it measures about three and a half inches. The belly is green, and the upper part of the neck, back, and wing-coverts, are of a resplendent and varied green and gold. The breast and lower parts are

white, the wings purplish-brown, and the tail partly of the same colour, with the two middle tail-feathers of vivid green.

In the warm climate of the more southern States, the beautiful little ruby-throat is found throughout the winter; and as the summer draws on, the heat in the northern States suiting its delicate constitution, it migrates in large flocks, appearing in the middle States towards the end of April. Tiny as they are, they pass through the air at a rapid rate, and may be seen moving in long undulations, now rising for some distance at an angle of about forty degrees, then falling in a curve. Their long flights are performed at night, it is supposed, as they are found feeding leisurely at all times of the day. Small as they are, from their rapid flight and meteor-like movements they do not fear the largest birds of prey; for even should the lordly eagle venture into their domains, the tiny creatures will attack him without fear: and one has been seen perched on the head of an eagle, at which it was pecking furiously away, scattering the feathers of the huge bird, who flew screaming through the air with alarm, to rid himself of his tiny assailant.

As they fly, the ruby feathers of their throats may be seen changing, according to the light, now into a greenish gold colour, now into a deep brown, again to flash forth with the brilliancy of precious gems. Often they may be observed flying round the deep, cup-shaped calix of the scarlet trumpet-flower, which with its rich foliage clings in clusters round the gnarled stem of some withered oak, clothing it with a verdure not its own. Into these deep and capacious tubes the ruby-throat, with its long bill, probes, and draws forth either the sweets it produces, or picks up the multitude of flies entangled in the nectar.

Although the ruby-throat ventures thus far north, it is very susceptible of cold, and returns southward immediately the summer green of the forest gives place to the golden tints of autumn. Brave and high-spirited as is the little bird, it is easily tamed; and Mr Webber, the naturalist, after many attempts, succeeded in securing several of the species. The first he caught did not flutter, or make the least attempt to escape, but remained quietly in his hand; and he saw, when he opened it, the minute creature lying on his palm, perfectly motionless, feigning most skilfully to be dead; indeed, actually playing "possum." For some time he watched it with breathless curiosity, when he saw it gradually open its bright little eyes to ascertain whether the way was clear, and then close them slowly as it caught his glance upon it. When a mixture of sugar,

water, and honey was brought, and a drop placed on the point of its bill, it came very suddenly to life, and in a moment was on its legs, drinking with eager gusto of the refreshing draught from a silver tea-spoon.

The nest of the ruby-throat is of a most delicate nature; the external parts being formed of a little grey lichen found on the branches of the trees, glued together by the saliva of the bird, and neatly arranged round the whole of the nest, as well as to some distance from the spot where it is attached to the branch or stem itself. The interior is lined with a cottony substance; and the innermost, with the silky fibres obtained from various plants. Within this little nest the female humming-bird lays two white and nearly oval eggs; generally raising two broods in the season. In one week, says Audubon, the young are ready to fly, but are fed by the parents for nearly another week. They receive their food direct from the bill of their parents, who disgorge it in the manner of canaries and pigeons. It is my belief that no sooner are the young able to provide for themselves than they associate with other broods, and perform their migrations apart from the old birds, as I have observed twenty or thirty young humming-birds resort to a group of trumpet-flowers, when not a single old bird was to be seen.

The plumage of the female is in most respects like that of the male, except that she is not possessed of the brilliant feathers on the throat which especially distinguish him.

Although there are several other species of humming-birds which live permanently in the Southern States of the Union, or migrate northward in summer, we cannot now inspect them. We shall have, however, many opportunities of examining a number of the species when we come to visit South America. Although the number of birds and the variety of their species inhabiting North America is very great, except those we have mentioned, they do not in general possess any very interesting peculiarity, which might tempt us to linger longer amongst them, and we will therefore wander on and inspect some of the curious reptiles which inhabit various parts of the American States and Canada.

The Cow-Bird.

The well-known spring visitor to the woods of England,—the cuckoo,—is undoubtedly destitute of family affection, as are others of its relatives; but this is not the case with the whole tribe. As the spring advances, from the sylvan glades of

Pennsylvania a curious note, constantly repeated, is heard, resembling the word "cow-cow." It is the note of a bird, and from the sound it resembles it is generally known as the "cow-bird." It is also called the "yellow-billed cuckoo." It is in no respect behind any of its neighbours of the grove in conjugal and parental affection, for it builds its nest, hatches its own eggs, and rears its own young, Wilson assures us. It is about a foot in length, clothed in a dark drab suit with a silken greenish gloss. A ruddy cinnamon tints the quill-feathers of the wings; and the tail consists partly of black feathers tipped with white, the two outer ones being of the same tint as the back. The under surface is a pure white. It has a long curved bill of a greyish-black above, and yellow beneath. The female differs from the male in having the central tail-feathers of a drab colour, while the under part of her body is of a greyish tinge.

Early in the spring the males frequently engage in desperate battles. After these contests are decided, the couples, pairing, begin building their nests, generally among the horizontal branches of an apple-tree. It is roughly formed of sticks and twigs. On this bed the eggs, three or four in number, of a uniform greenish-blue, are placed. While the female is sitting, the male is generally not far off, and gives the alarm by his notes should any person approach. The female sits so close, that she may almost be reached by the hand, and then suddenly precipitates herself to the ground, feigning lameness—to draw away the intruder from the spot—fluttering her wings, and tumbling over in the manner of a partridge, woodcock, and some other birds. Both parents unite in collecting food for the young. This consists, for the most part, of caterpillars, particularly such as infest apple-trees. They are accused, and with some justice, of sucking the eggs of other birds,—like the crow, blue jay, and other pillagers. They also occasionally eat various kinds of berries; but from the circumstance of their destroying numbers of very noxious larvae, they prove themselves the friend of the farmer, and are well deserving of his protection.

The Blue-Bird.

While the robin redbreast cheers us in England during winter with its song, the beautiful little blue-bird performs the same office with its rich sweet notes to the inhabitants of the United States; arriving from Mexico, and still further off regions, as soon as the first signs of approaching spring appear—even before the snow has melted away. Associating fearlessly with

human beings, it holds the same place in their affections as the robin.

It is about seven inches long—a rich azure-blue covering the whole upper surface of the head and neck, while the quill-feathers of the wing and tail are jet-black. The throat, breast, and sides are of a ruddy chestnut, the lower portion of the body being white. It builds its nest in the hollow of a decayed tree, sheltered from the rain and cold, and there deposits from four to six eggs at a time, generally rearing two, and sometimes three broods in the season. Its food consists chiefly of spiders and small worms, and soft fruits and seeds.

It is a hardy little bird, and makes its way through all parts of the United States; sometimes, indeed, remaining through the whole winter, when it takes shelter in some warm hollow beneath the snow, from whence, when the sun shines forth, it comes out to enjoy its warmth, and to sing a few cheerful notes. It is especially interesting to watch it take care of its nest and young; perching near them and singing merrily, occasionally flying off to procure a caterpillar for their gaping mouths.

So confiding is the blue-bird, that when a box with a hole in it is arranged in some convenient situation near a house, it will at once take possession, building its nest in it, and never failing to utter its sweet music in acknowledgment of the boon.

The Snow-Bird.

As the cold winter approaches, large flocks of little birds about six inches in length, with snow-white breasts and slaty-brown or blue backs, make their appearance in the neighbourhood of villages and farmhouses; sometimes, indeed, coming into towns as familiarly as sparrows. Their habits are very like those of sparrows; and when the snow deepens, they mix with them, searching together for the seeds in the sheltered corners of the fields, and along the borders of creeks and fences. They differ from the snow-bunting of the far north, with which they must not be confounded. In the summer they make their way to the northern regions in large flocks, and build their nests together, being of a very sociable disposition.

The Carolina Parrot.

While viewing the birds of North America, we cannot pass by the well-known, handsome Carolina parrot, which is,

notwithstanding its common name, a species of macaw. Large numbers of these beautiful birds are seen winging their way in compact bodies through the Southern States, flying with great rapidity and uttering a loud outrageous scream, not unlike that of the red-headed woodpecker. Sometimes their flight is in a direct line, but generally they perform a variety of elegant and serpentine meanders in their course through the air. Often they may be seen pitching on the large sycamore-trees, in the hollow trunks of which, as also among the branches, they generally roost—frequently forty and more together. Here they cling close to the side of the tree, holding fast by claws and bill. No creatures can be more sociable, and they may be observed scratching each other's heads and necks, and always nestling closely together.

Their plumage is mostly green washed with blue, but the forehead is of a reddish-orange—as are the shoulders, head, and wings, while the neck and back of the head are of a bright golden yellow. The wing-coverts are yellow tinged with green. The bird is about twenty-one inches long. The female is much like the male. She makes her nest in the hollows of trees.

The Carolina parrot exhibits great amiability of disposition, and is easily tamed, becoming much attached to those who treat it kindly. It also exhibits the most extraordinary affection for its own race. Wilson the naturalist, having obtained one while on a journey to the Far West, brought it home upwards of one thousand miles in his pocket. It quickly learned to know its name, and would immediately come when called. Procuring a cage, he placed the parrot under a piazza, where, by its call, it soon attracted the passing flocks of its relatives. Numerous parties frequently alighted on the trees immediately above, keeping up a constant conversation with the prisoner. One of these was wounded and captured. Poll evinced the greatest pleasure on meeting with this new companion. She crept close up to it, chattering in a low tone of voice, as if sympathising in its misfortune, scratching its head and neck with her bill—at night, both nestling as closely as possible to each other, sometimes Poll's head being thrust amongst the plumage of the other. The stranger, however, died, and Poll appeared restless and inconsolable for several days. On a looking-glass, however, being procured, the instant she perceived her image all her former fondness seemed to return, so that she could scarcely absent herself from it for a moment. It was evident she was completely deceived. Often when evening drew on, as also during the day, she laid her head close to that of the image in

the glass, and began to dose with great composure and satisfaction.

On another occasion several of these birds were shot down, when the whole flock swept rapidly round their prostrate companions, and settled on a low tree within twenty yards of them. Although many were killed, the rest, instead of flying away, continued looking down at their dead companions with manifest signs of sympathy and concern.

They render the farmer great service, by eating the cockle-burs which grow on the rich alluvial soil of Carolina. This prickly fruit is apt to come off on the wool of the sheep, which, in some places, it almost completely destroys. The bird also lives on the beech-nut and seeds of the cypress. The head—with the brains—and intestines of the Carolina parrot are said to be poisonous to eat; but how far such is the case seems to be a matter of doubt.

Its chief abode is along the shores of the Mississippi, and it reaches the neighbourhood of Lake Michigan; but eastward of the Alleghany Mountains it is seldom met with further north than the State of Maryland. Far more hardy than the generality of the parrot tribe, a flock has been seen facing a snow-storm along the banks of the Ohio.

Part 1—Chapter IX.

Reptiles.

Tortoises:—The Lettered Terrapin.

Taking the reptiles in their natural order, we must begin with the tortoises. There is a group of these slow-moving reptiles called terrapins in North America. One of the most common is the lettered terrapin, which inhabits rivers, lakes, and even marshes, where it lives on frogs and worms. It is especially detested by the angler, as it is apt to take hold of his bait, and when he expects to see a fine fish at the end of his line, he finds that a little tortoise has hold of it.

The back is of a dark brown, the edges being ornamented with scarlet marks, like some Eastern alphabet in form.

The Chicken Tortoise.

Large numbers of these little tortoises, about ten inches in length, are seen basking together on the logs or stones on the borders of lakes or streams. The slightest noise arouses them, when they slip off, splashing in all directions into the water. They swim with their little heads above the surface at a rapid rate, bearing a strong resemblance to water-snakes. The creature takes its name from the similarity of its flesh to that of a chicken. It is consequently in great requisition as food.

The Salt-Water Terrapin.

Another species—the salt-water terrapin—lives in the salt marshes and ponds. It is brown above, and generally yellow below—the lower jaw furnished with a sort of hook. The sides of the head are white, sprinkled with black spots.

The Box Tortoise.

The peculiarity of this creature is that it can draw its head within its shell, so that, as few creatures would wish to swallow such a morsel whole, it has no enemy except man to fear. It might, to be sure, run the risk of being carried off by an eagle and let drop on a hard rock, if the savage king of birds ever does perform such a feat; but though stories are frequently told of his doing so, their truth is greatly doubted.

The box tortoise lives on shore among the pine-forest lands, away from water, to which it seems to have an especial dislike. It is frequently called, therefore, the pine terrapin. It is one of the smallest of its tribe—being little more than six inches long—and varies very greatly in its colour. Its head is remarkable for having a somewhat broad hook at the end of the upper jaw—the lower jaw being slightly hooked.

The Mud Tortoise.

The mud tortoise is smaller than the box, being scarcely four inches in length. It can, however, move with considerable speed, and is seen floundering about in the ponds and muddy places, where it searches for aquatic insects, and sometimes even fish, on which it lives. It also vexes the angler by taking hold of his hook, and remaining so quietly sucking in the bait, that only when he hauls it up, and the tortoise begins to pull and kick violently about, does he discover his mistake.

It is remarkable for exuding a strong musky odour, from which circumstance it has obtained the name of “stink-pot.”

The Alligator Terrapin.

This giant of its tribe, from the great likeness it bears to the alligator, has appropriately been called after the huge saurian. It has a large head covered with a hard wrinkled skin, and a long thick neck, over which are scattered a number of projecting tubercles. On the shell of the adult animal there is a depression along the centre, which leaves a sort of keel on each side of the central line.

The creature is exceedingly voracious, feeding on fish, reptiles, or any animal substance. It generally inhabits stagnant pools or sluggish streams, living mostly at the bottom. Occasionally, however, it rises to the surface, and elevating the tip of its pointed snout above the water, floats along with the current. Sometimes, indeed, it lands, and makes its way to some distance from the river; but its motions are very awkward, not a little resembling those of the alligator.

A considerable number are taken by strong hooks, and, as the flesh is esteemed for food, are sold in the market.

The Snapping Turtle.

Although the last-named creature is sometimes called the snapping turtle, the animal to which the name appropriately applies is a very different creature. Its other name is the fierce trionyx.

It belongs to the family of tortoises, popularly called soft turtles. Its flattened head is rather oval, with horny jaws, and hanging fleshy lips, the mouth lengthened into a cylindrical snout. It has an extremely long neck, which it can contract at will; short, wide feet; and toes connected by strong webs. It is the most savage and formidable of its tribe; being terribly destructive, not only among fish, but smaller quadrupeds, birds, and reptiles, which it can capture. For this object it lies in wait till they come down to drink, or till some water-fowl flies too close to its haunt. It is said even to capture and eat young alligators.

Though devouring so many other creatures, the snapping turtle is often eaten himself; being hooked and drawn on shore by the fishermen. It fights, on such occasions, and struggles ferociously, darting its head here and there, endeavouring to seize the hands of its captors with its formidable jaws.

It possesses extraordinary tenacity of life; and even after the head is cut off, the body, it is asserted, will crawl for a short way over the ground.

Lizards:—The Six-Lined Taraguina.

We shall find several lizards in various parts of America—the greater number in the Southern States. The first we meet with is the six-lined taraguina, belonging to the family of teguexins, which are remarkable for the many-sided shields which cover their heads, and the double collar on the throat. This little creature is much smaller than the rest of its family—being only about eleven inches in length—of a darkish green or brown colour, with six narrow yellow streaks along its body, one of which on each side reaches from the eye to the middle of the tail. The lower part is of a silvery white hue, with a bluish tinge in some parts.

It is an excessively lively, active animal, living in dry and sandy places, where it may be found searching for insects. As it is very timid, it takes to flight at the slightest sound, and is not easily caught.

The Glass Snake.

As the spring comes on, and the warm sun bursts forth, a formidable snake-like creature, nearly three feet in length, is often seen frequenting the plantations of the sweet potato, or coiled up beneath the roots of an old tree; its keen eye watching for any small reptile or insect which may be passing. The head is small in proportion to the body, and of a pyramidal form—mottled at the sides with black and green, the jaws edged with yellow. Its abdomen is bright yellow; and the upper part of the ear is marked with numerous lines of black, green, and yellow.

Altogether, it has a very venomous look about it; but is truly one of the most harmless of creatures, not being a snake at all, though it goes by the name of the glass snake. It is in reality a lizard; though—not having the vestige of limbs—it is appropriately called the lizard-snake. It has, however, eyelids; and the tongue is not sheathed at the base, as is the case with serpents; while its solid jaw-bones do not enable it to open its mouth, as they are capable of doing. It has a tail, twice the length of its body, from which it can with difficulty be distinguished.

Its peculiar characteristic is its extraordinary fragility— arising from the muscles being articulated quite through the vertebrae. If struck with a switch, the body is easily broken in two or more parts. Sometimes, indeed, the creature breaks off its own tail, by a remarkable habit it possesses of contracting the muscles with great force. The common English blind-worm breaks to pieces in a similar manner.

The Anolis.

Among the true lizards is a pretty little creature known as the green Carolina anolis. It is especially daring; not only refusing to run away at the approach of man, but will enter houses, and run about the room in search of flies. It is very active, climbing trees, and leaping from branch to branch in its search for insects, of which it destroys great numbers. It is about seven inches long—mostly of a beautiful green above, with white below; and it has a white throat-pouch, which generally appears with a few bars of red upon it, but when inflated the colour spreads over the whole surface.

Mr Gosse describes one which he saw running about among the branches of a sassafras, just as it had seized a grasshopper. He caught the creature, which was then of a green hue; but, on placing it on an old log, the colour changed to a brownish-black. He was told, that if placed on a green leaf it would again become green. In a short time, after remaining in the sunshine, it changed once more to green. Again it became almost black; and shutting it up in a desk, after half an hour he was no less surprised than delighted to see the lizard of a brilliant green, the line down the back only being blackish.

When the animal is excited, the pouch, swelling out, becomes of a crimson colour. It is covered with excessively small—scarcely perceptible—scales.

These little creatures are at times very quarrelsome, and will fight together, frequently both the combatants losing their tails in the contest; while their pouches swell out as they leap at each other and struggle furiously.

The Crowned Tapayaxin.

This is the scientific name of a creature generally known under the title of the horned-toad, though really a lizard. Its head is of a light brown, marked with dark spots, the under part being of a dull yellow; and is armed with long conical spines, set round the

edge and pointing backwards. The back is covered with shorter and stouter spines, of a triangular shape, extending to the very point of the tail—also armed with a strong row of spines, which gives it a completely toothed appearance. The colour of this curiously covered back is grey, with irregular bands of chestnut-brown across it.

Formidable as it looks, it is not only harmless, but never retaliates when attacked, and remains perfectly quiet when taken in the hand. It is also easily tamed, and learns to know its owner, and to take food from his hand—preferring little red ants, though it eats readily beetles, flies, and other insects. From its small, rounded form, and the mode of sitting, it has in all likelihood gained its common name of the horned-toad.

Snakes:—The Rattlesnake.

Throughout North America there are no small number and variety of venomous snakes. The rattlesnakes are perhaps the most numerous, frequenting all parts of the country, though they generally keep to the uninhabited portions. They are found on the northern shores of Lake Superior—though the ground is covered for several months in the year with snow—and often appear in the regions to the west, in the same latitude, up to the Rocky Mountains. They would render some districts uninhabitable, were it not for the signal-giving rattles with which they are armed. Even quadrupeds are alarmed at the sound, and endeavour to make their escape from them; and horses, it is said, lately arrived from Europe, show the same dread of these deadly serpents as do those born in the country, so that nothing will induce them to pass within striking distance of the creatures.

The wanderer through the forest starts back with dismay as he comes suddenly upon one of these venomous reptiles, and hears its ominous rattle when too near to escape. He must muster all his nerve, and strike it with his stick as it springs; for a wound from its fangs will, as he knows, bring certain death, far-away from human aid.

The rattlesnake, like others of its tribe in cold regions, hibernates in winter; and as the autumn comes on, seeks some convenient crevice in which to pass the cold season—generally in the neighbourhood of marshy ground, where it can cover itself up in the masses of a peculiar species of moss growing in such situations. The reptiles are here, during the winter, frequently hunted out and destroyed. At that time, too, their

bite is much less dangerous than in the summer— the amount of venom appearing to decrease with the increase of cold.

The Banded and Military Rattlesnakes.

Besides the common rattlesnake, there is another known as the banded rattlesnake, and a third species called the small, or military rattlesnake. The latter is more dreaded, from being of less size, and not so easily killed as the former. The sound made by its rattle is extremely feeble, so that it cannot be heard at any great distance. However, as we shall pay more attention to the serpent tribe when we visit South America, where the rattlesnake is also found, we will wait till then to inspect the formation of its rattle, and its other peculiarities.

The Corn Snake.

There are many more harmless than venomous snakes in North America. One of the handsomest of its tribe is the corn snake, belonging to the family of the Colubrinae. As it avoids the daylight, though very common, it is not often seen in a wild state.

It is, however, frequently tamed by the inhabitants of farmhouses—when it makes itself perfectly at home, and is even of more service than a cat in devouring rats and mice; though occasionally, if a young chicken come in its way, it may gobble it up. This it can easily do, as it is of great size—varying from five to six feet in length. The colours of its body are remarkably brilliant; the general tint being a rich chestnut red, with large patches of a still brighter and deeper red edged with black running along each side, and a second row of smaller spots of golden yellow, alternated with larger ones. The lower portion of the body is silvery white, checkered with black.

The Thunder Snake.

No fiercer-looking member of the snake family exists in North America—with its mottled head, and black and white body, four feet at least in length—than the quarrelsome thunder snake. From the chain-like markings on its body, it is sometimes called the chain snake; and by others the king snake, on account of its tyrannical disposition.

Though fangless, it is fierce and bold, and has been known to attack, kill, and eat a rattlesnake; indeed, it will assault any member of its family, if not of its own species, even though but

little smaller than itself. It feeds on small quadrupeds, birds, and reptiles; and few human beings who see it moving amid the shady places it inhabits, would fail to get out of its way as quickly as possible.

The Chicken Snake.

The bright golden brown chicken snake—marked with narrow stripes along the back, and from four to seven feet in length—in spite of its beautiful and fangless mouth, is an unwelcome visitor in farmhouses when it comes as a stranger, for it is apt to carry off fowls from their roost—as well as their eggs—and will eat up a brood of ducklings without ceremony.

However, as it is of an amiable disposition, it can easily be tamed; and then, having learned good manners, it becomes a favourite, and recompenses its protectors by killing the rats and mice which frequent their premises.

The Milk or House Snake.

The beautiful blue house snake—four feet in length, with rows of spots on its side—is often mistaken for the corn snake, its habits being very similar. The lower part of the body is of a silvery white, tessellated with oblong marks of black. The ignorant fancy that it sucks the milk from the udders of the cows, and hence its name; though, probably, it has no objection to a little milk, if it finds it in a pan. Its object, however, in entering houses and farms, is to search for mice and insects, on which it in reality feeds, never interfering with the cows or other animals.

The Black Snake.

In many parts of the country, the black snake, on account of its rapid movements, is called the "racer." Though fangless, it often, in consequence of the way in which it rustles its tail among the dry herbage, making a sound similar to that of the rattlesnake, gives no small alarm to the wanderer among the brushwood near the edges of streams or ponds. It is also frequently encountered in the fields or on the roads.

It is generally from five to six feet in length; of a blue-black above, and an ashy grey below. It climbs trees in search of birds or their eggs; and if interrupted in its employment, will turn its rage against the intruder. Sometimes, it is asserted, it will, to his horror, leap down and give him a bite; though the

only injury likely to arise is that to his nervous system from fright. Its bite is, indeed, perfectly harmless; and it does good service in hunting rats which live in the outbuildings, being able to climb walls and insinuate itself into the most intricate passages when chasing them.

The Coach-Whip Snake.

The last snake we will mention is the coach-whip snake, belonging to the family of Dryadidae. No serpent can surpass it in the rapidity of its movements, as, with its lithe, black body—between five and six feet in length—and whiplike tail, it makes its way amid the grass in pursuit of its prey. It seems literally to fly over the ground with the speed of lightning.

It is curiously like the thong of a whip, being very long in proportion to its girth, with a remarkably small head and neck; its smooth scales—so arranged as greatly to resemble the plaited leather of a whip—of a polished brown-black hue increasing the resemblance.

When about to seize its prey, it darts forward with open mouth, grasping the animal; in an instant it winds its lithe body and tail round and round it, so as to make escape impossible. It will thus attack birds of prey of considerable size, and come off victorious.

Travellers unacquainted with the reptiles which haunt the wilds of America, on first seeing a whip-snake rapidly approaching, will, with sensations of alarm, urge on their steeds to escape—for it appears fully capable of springing up and inflicting mortal injury; but, from having no fangs, it is unable to harm any one. From the delicacy of its colour, the elegance of its form, and the rapidity and gracefulness of its movements, it cannot fail to be admired.

Frogs:—The Bull Frog.

We shall find no small number of the frog race throughout America. Worthy of being the president of his nation is that enormous batrachian, the bull frog, both from his size, the power of his notes, and his hardihood and endurance. If we visit at night the neighbourhood of some pool or marsh, we shall soon learn to know the sound of his voice, especially when perhaps he and five hundred of his family are, with their heads half out of the water, amusing themselves in the performance of a concert, each striving to outdo his neighbour in the loudness

of his tones. He is a first-rate swimmer; and when driven out of the hole in which he passes the warm hours of the day, he plunges into the water, and skims along the surface some distance before he dives below it. Only on such occasions, or when, perhaps, a dark thunder-cloud shrouds the sky, does he appear in the daytime, and give utterance to his notes.

He feeds on snails and water creatures; sometimes on crayfish and other crustaceans; and occasionally, if a duckling or young chicken come in his way, he will not scruple to take them into his capacious maw.

His ordinary size is from six to seven inches; but specimens have been met with which have measured nineteen—and even twenty—inches, from the nose to the extremity of their feet. He has a smooth black skin above, with a greenish hue on the head, and lower part of the body greyish-white—the throat being white, dotted with green. He can take enormous leaps; and is so admirable a swimmer, that specimens have been known to exist in the water without once landing for several years.

The Solitary Frog.

Inland, where no water is to be found, we shall meet with a creature of an olive colour—the back covered with tubercles—and with a blunt nose. It might easily be mistaken for a toad, though it is a veritable frog. Even in winter, before the snow has disappeared, we may see the hardy little creature making its way over the frozen surface of the ground. At the breeding season, however, it returns, like other frogs, to the water. It resides for the chief part of the year in sandy districts, in which it forms burrows, about six inches in depth, by means of a flat, sharp-edged spur, with which it is furnished. Into these burrows it makes its way backwards, very much as a crab crawls into its hole when seeking shelter from danger. There it sits, with its head poked out, watching for passing prey.

The Savannah Cricket Frog.

Both in the Northern and Southern States we shall find a merry little creature, with a voice greatly resembling that of the cricket. Living near the borders of stagnant pools, it frequently takes its seat on the large leaves of water-lilies and other aquatic plants; being able, by curious discs on its toes, to crawl easily over their smooth surfaces.

It is among the smallest of its tribe, measuring only one and a half inches in length. It is of a greenish-brown, variegated with streaks of green and white, the under surface being of a yellowish-grey, tinged with pink, and the legs banded. Its body is slender, with the hind-legs very long, enabling it to take enormous leaps to escape danger.

The Changeable Tree Frog.

Throughout all parts of the continent we shall find a curious little toad, about two inches in length, which possesses the nature of the chameleon—in being able to change its colour according to the tints of the object on which it rests. By this means, so completely does it assimilate its hue to the ground, that it often escapes observation. The changes of colour it thus rapidly passes through are indeed remarkable. From a nearly perfect white, it can assume every intermediate shade to a dark brown. It has a very toad-like look, and possesses skin glands which secrete an acrid fluid. Thus it is able, when attacked, to defend itself, as well as escape observation.

It may frequently be found on old plum-trees, where it climbs in search of the insects which there congregate. We shall frequently hear its voice, especially before rain, for it is a noisy creature. It has a liquid note, sounding like "el" frequently repeated, and then ending with a sharp, short monosyllable.

It leaves its arboreal habitation during the breeding season, and makes its way to the nearest pools, where it joins in the concerts of its relatives.

It hibernates during winter, burrowing beneath the damp ground.

The Spotted Eft.

Related to the salamanders, we shall find a curious creature in Pennsylvania, and other parts of the States, known as the spotted eft, or ambystome. It has a thick, convex head, with a rounded muzzle; and is of a deep violet-black colour above, and purplish-black below, the sides being ornamented with a row of large yellow spots. Unlike other newts, it deposits its eggs in small packets under damp stones. There is another similar creature with mole-like habits, which burrows under the ground, found in various parts of the States.

The Menopoma.

Another of the same order—a formidable and savage creature—is the menopoma, inhabiting the Ohio, Alleghany, and other rivers of the south, frequently, from its propensities, called the young alligator. It is also known as the “ground puppy,” the “mud devil,” and other well-deserved, if not complimentary names.

It is about two feet in length; but the teeth, for its size, are small. In appearance, it is ugly in the extreme; and as, from its voracious habits, it devours a number of fish, and bites fiercely when captured, it is especially hated by the fishermen, who believe it to be venomous, and treat it as seamen do the detested shark.

The above names have been given to it in consequence of its voracity, and its being found generally in muddy bottoms.

The Congo Snake.

In digging into the mud, sometimes a number of snake-like creatures, between two and three feet long, are turned up—which have hidden themselves away, often three feet below the surface—in the Southern States. On examination, however, they will be found to have legs, though small and feeble, with only two toes on each foot. They are of a blackish-grey above, and a lighter hue beneath.

Another species of congo snake is found with three toes,—hence the name of three-toed congo snake is given to it.

The Necturus.

Related to the curious eyeless proteus, found in the celebrated cavern of Adelsberg, is an animal very much larger, called the necturus, inhabiting the waters of the Mississippi, and several southern lakes. It is a creature nearly three feet in length, with a thick body, and, being designed to live in daylight, possesses eyes. It is between a fish and a reptile, as it is furnished with large, well-tufted gills; and, at the same time, has four legs, and four toes on each foot, though it is destitute of claws.

It is of an olive-brown colour dotted with black, and a black streak reaching from one end of the body to the termination of the somewhat thick, short tail.

The Siren, or Mud Eel.

Another curious batrachian, the mud eel, is found in Carolina, in marshy situations. Its total length is about three feet. The head is small, as is the eye, while on each side of it are three beautifully plumed gill-tufts. It has no hind-legs; while the front pair are very small, and do not aid it in moving along the ground. This it does in the wriggling fashion of an eel; indeed, when discovered in the soft mud in which it delights to live, the creature, at the first glance, would be taken for an eel. It has many of the habits of that animal, living on worms and insects; indeed, it is difficult to say whether it should be classed with eels or batrachians. It is, however, a true amphibian, respiring either in the water by means of branchiae, or in the air by means of lungs. It approaches, in the structure of its head, to the salamanders, though much less so in its general form and proportions.

The curious "axolotl," which we shall meet with in Mexico, belongs to a closely allied genus.

Grasshoppers, or Locusts.

When travelling across the prairies, we may, at times, when gazing upwards at the sky, see what appears to be a vast cloud approaching from the horizon. It is produced by infinite swarms of locusts, or grasshoppers, as they are called in North America. (From Professor Hind's "Red River Exploring Expedition.") About noon they appear to lessen perceptibly the rays of the sun. The whole horizon wears an unearthly ashy hue, from the light reflected by their transparent wings. The air is filled as with flakes of snow. The clouds of insects, forming a dense body, cast a glimmering, silvery light from altitudes varying from 500 to 1000 feet. The sky, as near the sun as its light will allow us to gaze, appears continually changing colour, from blue to silvery white, ashy grey, and lead colour, according to the numbers in the passing clouds of insects. Opposite to the sun, the prevailing hue is a silvery white, perceptibly flashing. Now, towards the south, east, and west, it appears to radiate a soft, grey-tinted light, with a quivering motion. Should the day be calm, the hum produced by the vibration of so many millions of wings is quite indescribable, and more resembles the noise popularly termed "a ringing in one's ears," than any other sound. The aspect of the heavens during the period that the greatest flight is passing by is singularly striking. It produces a feeling of uneasiness, amazement, and awe, as if some terrible unforeseen calamity were about to happen.

When the grasshoppers are resting from their long journeys, or in the morning when feeding on the grass and leaves, they rise in clouds as we march through the prairie; and when the wind blows, they become very troublesome, flying with force against our faces, and into the nostrils and eyes of the horses, filling every crevice in the carts. Fortunately, comparatively few take flight on a windy day, otherwise it would be impossible to make headway against such an infinite host in rapid motion before the wind, although composed individually of such insignificant members. The portions of the prairie visited by the grasshoppers wear a curious appearance. The grass may be seen cut uniformly to one inch from the ground. The whole surface is covered with the small, round, green exuviae of these destructive invaders. They frequently fly at an enormous height above the earth. An engineer engaged in the Nebraska survey, mentions that, when standing on the summit of a peak of the Rocky Mountains, 8500 feet above the level of the plains in Nebraska—being 14,500 feet above that of the sea—he saw them above his head as far as their size rendered them visible.

Grasshoppers are excellent prognosticators of a coming storm. They may be seen at times descending perpendicularly from a great height, like hail—a sign of approaching rain. At this time the air, as far as the eye can penetrate, appears filled with them. Early in the morning they commence their flight, and continue it till late in the afternoon, when they settle round the traveller in countless multitudes, clinging to the leaves of the grass, as if resting after their journey.

They are fearful depredators. Not only do they destroy the husbandman's crops, but so voracious are they, that they will attack every article left even for a few minutes on the ground—saddle-girths, leather bags, and clothing of all descriptions, are devoured without distinction. Mr Hind says that ten minutes sufficed for them to destroy three pairs of woollen trousers which had been carelessly thrown on the grass. The only way to protect property from these depredators is to pile it on a waggon or cart out of reach.

Two distinct broods of grasshoppers appear—one with wings not yet formed, which has been hatched on the spot; the other, full-grown invaders from the southern latitudes. They sometimes make their appearance at Red River. However, Mr Ross, for long a resident in that region, states that from 1819, when the colonists' scanty crops were destroyed by grasshoppers, to 1856, they had not returned in sufficient numbers to commit any material damage. Their ravages, indeed, are not to be


compared to those committed by the red locust in Egypt; and yet Egypt has ever been one of the chief granaries of the world.

Part 2—Chapter I.

Mexico and Central America.

Mexico.

If we glance over Mexico, we shall see that the country is, like the continent of which it forms a part, of a triangular shape,—the eastern portion bounded by the Gulf of Mexico, low and flat sandy deserts or noxious marshes being spread over it, and with a narrow belt of level land at the base of the mountains on the Pacific shore. A series of terraces broken by ravines form the sides of a vast table-land,—six thousand feet above the plain,—which stretches from north to south throughout the interior, separated here and there by rocky ridges into smaller plateaux; while vast mountains in several parts rise from their midst—that of Popocatepetl, the highest in Mexico, reaching to a height of 17,884 feet, with Orizaba, almost of equal elevation, and several mountains not much inferior to them, their snowy summits seen from afar, through the clear atmosphere of that lofty region. Several are active volcanoes; the most curious being that of Jorullo, surrounded by miniature mountains emitting smoke and fire, and presenting the wildest scene of utter desolation. They form pinnacles of the great range of the Andes and the Rocky Mountains. From the midst of the great table-land of Anahuac, flows towards the north the river of Santiago, its course exceeding four hundred miles, passing in its way through the large lake of Chapala. Some of these table-lands are even eight thousand feet above the sea. The most lofty is so cold, that during the greater part of the day the thermometer varies between 42 degrees and 46 degrees. The great table-land to the east of the Sierra Madre has an elevation which varies from three thousand to six thousand feet. To the

west of that sierra,  is the region of Sonora; while eastward, across the Rocky Mountains, is the great valley of New Mexico, watered by the Rio Grande del Norte, which has a course of nearly fourteen hundred miles.

We have thus, in Mexico, a region of elevated plateaux with numerous lofty mountains, steep and broken hill-sides, with deep valleys, watered by numerous streams, and a wide extent

of low, level country under the rays of a tropical sun. These several regions possess a great difference in climate, and a corresponding variation in their productions, and, in most instances, in the animals which inhabit them. The domestic animals introduced by the Spaniards, have multiplied greatly, so that vast herds of cattle and horses run wild on the table-lands and lower tracts. Sheep also abound, especially on the northern table-lands. The buffalo makes his way to the great plains bordering the Red River and Arkansas; while deer, in large herds, abound on the higher plains. They are followed, as elsewhere, by packs of wolves and foxes or wild dogs; while the puma makes himself at home here, as he does in Southern America. The bear takes possession of many a mountain cavern; the beaver and otter inhabit the banks of the streams and lakes; the raccoon is found in the woods; and the antelope bounds across the plains.

We know more about the feathered tribes than the mammalia of Mexico. There are upwards of one hundred and fourteen species of land birds, one half of which are unknown in other parts of the world. Still, out of this entire number of species, only one new genus—which connects the family of the tyrant-shrikes with that of the caterpillar-catchers—has been discovered. There are two species of this genus, in both of which the males differ greatly from the females. In this intermediate region we find numerous genera which exist both in Northern and, Southern America intermixed. Several South American birds have found their way into Mexico,—as the mot-mots and trogons, the harpy and carracara eagles, the hang-nest, the true and red tanagers, parrots, parrakeets, macaws, creepers, crest-finches, and the fork-tailed and even-tailed humming-birds. Of the genera peculiar to North America,—but which are unknown in the South,—found in Mexico, are the fan-tailed wagtails, titmice, and worm-eating warblers—blue robins, ground-finch and sand-finch, crescent-starlings and ground-woodpecker. The sand-finch is, however, found in the Brazils. Vast numbers of aquatic birds frequent the lakes and marshes of the table-lands of the interior, as well as the rivers and shores of the coast, nearly the whole of which are well known in the United States, the greater number also inhabiting the Arctic regions.

Among the reptiles, there is one curious creature, peculiar to the country, allied to the siren of Carolina. It is the axolotl, which partakes of the form of a fish, and abounds in many of the lakes in Mexico. It is much esteemed as an article of food by the inhabitants of the neighbourhood.

We cannot speak of Mexico without having our minds drawn to the time of the Aztec monarchy,—when sumptuous palaces, enormous temples, fortresses, and other public edifices covered the face of the country. In the midst of the territory, on the western shore of the large lake of Tezcuco, stood the city of Tenochtitlan, the superb capital of the unfortunate Montezuma, on the site of which has arisen the modern Mexico. Though its glory has long passed away, the enormous ruins which still remain attest its past grandeur. Vast pyramids, on a scale and of a massiveness which vie with those of Egypt, still rear their lofty heads in great numbers throughout the country; while the ruins of other buildings prove that the architecture of Mexico in many points resembled that on the banks of the Nile. Some of these pyramids might rather be called towers. They consist of a series of truncated pyramids placed one above another, each successive one being smaller than the one on which it immediately rests—thus standing in reality upon a platform or terrace. The great pyramidal tower of Cholula is of this character, resembling somewhat the temple of Belus, according to the description given of it by Herodotus. It reaches a height of 177 feet, and the length of each side of its base is 1440 feet. In its neighbourhood are two other pyramids—teocalles, as they are called—of smaller dimensions. These temples, or teocalles, were very numerous, and in each of the principal cities there were several hundreds of them. The top, on which was a broad area, was reached by a flight of steps. On this area were one or two towers forty or fifty feet high, in which stood the images of the presiding deities. In front of the towers was the stone of sacrifice, and two lofty altars, on which fires were kept burning, inextinguishable as those in the temple of Vesta. In the great temple of Mexico there were said to be six hundred of these altars, the fires from which illuminated the streets through the darkest night.

Deeply interesting as is the subject of the architecture and the remarkable state of civilisation of the Aztecs, we must not dwell longer upon it, except to mention the cyclopean roads and bridges, constructed of huge blocks of stone, and carried on a continuous level, across valleys, which still remain. There are also, in various parts of the country, excavations, rock-hewn halls, and caverns, generally dome-shaped, the centre apartment lighted through an aperture in the vault. They somewhat resemble the cyclopean fabric near Argos, called the Treasury of Atreus. Not only the buildings, but the hieroglyphics, of the Aztecs, so closely resemble those of the Egyptians, that there appears every reason to suppose they were derived from the same source.

Among the natural curiosities of Mexico, one of the most remarkable is that of the rock-bridge in the valley Icononzo, which might, from its form—until closely examined—be mistaken for a work of art.

The great mass of the population of Mexico consists of the descendants of those tribes which inhabited the country at the time of the Spanish invasion. The language most extensively spoken, as well by the civilised as the savage tribes, is still that of the Aztecs. The people of pure European blood are supposed not to amount to thirty thousand. About a quarter of the population consists of Creoles, descendants of Europeans and Indians known as Mestizos, while there is a small number of Mulattoes, and another race, the Zambos—descendants of Africans and Indians.

Mexico has long been in a chronic state of revolution. From a province of Spain it became an independent empire; afterwards a republic; and once more, under the unfortunate Maximilian, it was placed under imperial rule, finally to fall into a far greater state of anarchy than before.

Before we quit Mexico, a remarkable result of hydraulic action must be mentioned, found on the sea-coast of that region. It is known as the buffadero. At the termination of a long rugged point, the water of the ocean, forced by a current or the waves, is projected through a fissure or natural tube in the rock, forming a beautiful *jet d'eau* many feet in height.

Birds of Mexico:—The Scarlet Tanager.

Among the winter inhabitants of Mexico, one of the handsomest is the scarlet tanager—a small bird, being only six or seven inches in length. It migrates north in the spring, generally making its appearance in the United States about the end of April, where it remains till the breeding season is over.

The colour of the male bird is a brilliant scarlet, with the exception of the tail and wings, which are deep black. The tail is forked, and has a white tip. This gay plumage is, however, only donned during the summer, for when it returns to Mexico in the autumn, its body is covered with a number of greyish-yellow feathers, giving it a mottled appearance. Its note is powerful, but not particularly musical.

Wilson describes it as a remarkably affectionate bird. Having captured a young one, it was placed in a cage high up on a tree.

The father bird discovered it, and was seen to bring it food, roosting at night on a neighbouring bough. After continuing to do so for three or four days, he showed by his actions and voice that he was trying to make the young one come out and follow him. So distressed did he appear, that at last the kind-hearted naturalist set the prisoner at liberty, when it flew off with its parent, who, with notes of exultation, accompanied its flight to the woods.

The Anis, or Savannah Blackbird.

The farmers of Mexico and the Southern States of America whose fields are frequented by the anis, are much indebted to that handsome and somewhat conspicuous bird. It is of a black hue glossed with green, equalling a pigeon in size—its long tail adding to its apparent length. Its chief food consists of grasshoppers, locusts, and small lizards, but it rids cows of the ticks and other parasitic insects which fasten on their backs, where they cannot be rubbed off. So conscious are the cattle of the service thus rendered them, that they will lie down to allow the blackbird to perform the operation at its ease. It is even asserted that, should the cow neglect to place herself in a suitable attitude, the blackbird will hop about in front of her nose, and allow her no peace till she does as required.

Large flocks of these birds appear together, uttering deafening cries. When fired at, even though many of them are killed, the survivors hover to a short distance, regardless of the danger in which they are placed. They build remarkably large nests; sometimes, indeed, several pairs of birds build one together—much in the same way as do the sociable weaver-birds of Africa—where they live together on friendly terms.

It resembles another African bird in its habit of picking off ticks from the backs of oxen, the same duty being performed by the South American goatsucker.

Massina's Trogon—The Mexican Trogon.

These birds are remarkable for their beautiful plumage. The first measures about fourteen inches in length. The crown of the head, back, and chest are of a deep, rich green; the ear-coverts and throat, glossy black; the breast and abdomen, of a rich scarlet. A grey tint covers the centre of the wings, which are pencilled with jet-black lines. The quill-feathers are also black, each being edged with white; and the bill is a light yellow. The females differ considerably from the males. They are shy and

retiring birds, and their habits, consequently, are difficult to study.

The Mexican trogon is much smaller than the former, being only a foot in total length, of which the tail occupies nearly eight inches. Few birds are more beautifully adorned than the male trogon. The head is of a bright yellow; the upper surface of the body, with the chest, being of a rich, glossy green; while the whole under surface is a bright scarlet. The throat and ear-coverts are black, and a white band of a crescent shape surrounds the throat. The wings are nearly entirely black. The tail is partly black, the two central feathers being green, tipped with black. The females and young males differ greatly, but their plumage is still very handsome.

The Resplendent Trogon.

The resplendent trogon is a native of Mexico, and, like all its congeners, is fond of hiding its beauty in the dark glades of the rich tropical forests. Its skin is remarkably delicate, and so thin that it has been compared to wet blotting-paper; while the plumage is so lightly set, that when the bird is shot, the feathers will fall freely from their sockets, through the force of the blow.

The colour of the adult male bird is a rich golden green, on the crest, head, neck, throat, chest, and shoulder-plumes. The breast and under parts shine with as bright a scarlet as the uniform of an English guardsman; the central feathers of the tail are black, and the exterior white, with black bars. The resplendent plumes which overhang the tail are seldom less than three feet in length, so that the total length of this gorgeous bird will frequently reach four feet. The bill is of a light yellow.

This species of trogon feeds chiefly on vegetable diet. We may add that in old times its long plumes were among the insignia of Mexican monarchy, and none but members of the "blood royal" were permitted to wear its gorgeous feathers.

Reptiles:—The Rhinophryne.

The tongues of frogs, instead of pointing outwards, are directed towards the throat. This species differs from the rest of its tribe, by having its tongue free and pointing forwards. Its rounded head sinks completely into the body, the muzzle being abruptly truncated, so as to form a circular disc in front. So extremely

small is the gape, that it would not be supposed, if separated from the body, to have belonged to a frog. On each side of the neck there is a gland, deeply sunk, and almost concealed by the skin.

The body of this curious creature is extremely short and thick, and its feet are half webbed. At the end of each of the hinder feet is a flat, oval, horny spur—its only means of offence and defence, as it possesses no teeth in its head.

It is of a slaty-grey colour, with yellow spots on the sides and back. Occasionally the latter unite, so as to form a jagged line along the back.

The Axolotl.

Among the batrachians found in Mexico is the curious axolotl, which frequents the great lake on which the chief city is built, as well as numerous other lakes, some at a considerable elevation above the ocean. It is between eight and ten inches long, of rather a dark greyish-brown colour, thickly covered with black spots. Those who have seen a newt in its larva state, may form a correct idea of the gills which project from either side of the head.

Naturalists differ in opinion as to whether it is really an adult batrachian, or merely the larva of some much larger creature. In many localities it is very plentiful; and the flesh being eatable and of a delicate character, the creature is sold in great numbers in the markets.

Being furnished with both kinds of respiratory organs, it can breathe equally well on land or in the water. It has a broad, flat head, blunt nose, and eyes situated near the muzzle. Though living so much in the water, its toes are not connected by intermediate membranes—indeed, they appear only to be intended for service on shore—its tail, nearly as long as its body, serving as a propeller in the water.

Part 2—Chapter II.

Central America.

Leaving the continent of North America, which may be said to terminate at the southern end of Mexico, we enter that

extremely irregular portion of land which, now widening, now narrowing again, stretches in a south-easterly direction till it unites with the southern half of the American continent at the Isthmus of Panama. We find in Central America three marked centres of elevation. The first we reach is the great plain, nearly 6000 feet above the level of the sea, on which the city of Guatemala is situated. Numerous volcanic peaks rise from its midst; from it also flow several large rivers, some falling into the Gulf of Mexico, others eastward into the Gulf of Honduras, while smaller streams send their waters westward into the Pacific Ocean. The banks of these rivers are mostly covered with the richest tropical vegetation—the scenery of the river Polochie in Guatemala being especially beautiful. Another high plain occupies the centre of Honduras, and extends into the northern part of Nicaragua. From it also rise numberless streams, some emptying themselves into the Caribbean Sea, and others into the Lakes of Nicaragua and Managua. Further south rises the volcano of Cartago. Here the Cordilleras resume their general character of a vast mountain barrier, but once more sink down into low ridges as the chain passes through the Isthmus of Panama.

As in South America, the Cordilleras run close along the Pacific coast. In consequence, the rivers which flow from their heights have a long course on the Atlantic side, and have carried down a large quantity of alluvial soil. Here, too, rain falls in greater or lesser quantities throughout the year. The vegetation is consequently rank, and the climate damp, and proportionately unhealthy. As the trade-winds blow from the north-east, the moisture with which they are saturated is condensed against the mountainsides, and flows backwards towards the Atlantic. The Pacific slope is, therefore, comparatively dry and salubrious—as indeed are also the elevated table-lands of the interior.

The whole region is subject to earthquakes, and numberless volcanoes rise in all directions. In the low ridge which separates the Lake of Nicaragua from the Pacific are several volcanic hills, most of them active; while further to the north-west, in the district of Conchagua—scarcely more than one hundred and eighty miles in length—there are upwards of twenty volcanoes. The two most lofty are found in the Guatemala range—that of Fuego being upwards of 12,000 feet in height, and that of Agua, 18,000 feet.

Many parts of the interior of the country have been but very partially explored, and are, indeed, almost unknown. Of the

purely native tribes, most of them have become mingled with Spaniards or negroes. Parts of the coast are inhabited by mixed races of Caribs, who have migrated from Saint Vincent, one of the Leeward islands. These Caribs are known as the Black and Yellow Caribs—the former being the descendants of the survivors of the cargo of an African slaver, wrecked in the neighbourhood of that island. The descendants of the Spaniards are the dominant race, and they have divided the country into various republics, though the greater portion is still in almost as savage a condition as when first discovered.

Honduras and the Mosquito Country.

The English have, however, a settlement in Honduras; and there is an Indian state forming the eastern portion of Nicaragua, under the government—if so it can be called—of a native king. His territory is known as the Mosquito Country, from the name of the chief native tribe over which he rules.

The climate is very similar to that of the West Indies. On the lower lands a variety of tropical productions can be brought to perfection, while in the high regions cereals of various sorts are abundantly produced.

Fauna.

The fauna partakes partly of the character of that of the equatorial regions of South America, and of the semi-tropical districts of Mexico. There are several varieties of ant-eaters, similar to those found in the valley of the Amazon, while the grey squirrel of more northern latitudes skips playfully amid the forests of the interior. In the woods and wide savannahs are two or more varieties of deer—one resembling the European deer in colour, but of less size, and adorned with large antlers. The other is of a lighter and browner tint, possessing short, smooth-pointed horns. The peccary is common in the valleys and low ground along the coast; while the waree, or wild hog, runs in large droves in many districts. The tapir, similar to that of the southern continent, also frequents the seashore and banks of the rivers; and another species, peculiar to the region, is said to have been discovered lately. There are numerous varieties of monkeys, among which are the brown, the horned, and the little, playful capuchin. The raccoon, as elsewhere, is common, and is noted for its thieving propensities. It lives chiefly on animal food. There is an interesting little opossum of about ten feet in length, of a grey colour, with a somewhat large head, and a long and very flexible tail—the feet being

provided with sharp claws. When the young leave the mother's pouch, she can place them on her back, to which they cling, while she scrambles amid the forest boughs. Besides the great ant-eater, there is the smaller striped ant-eater, and the little ant-eater. There is a curious creature, called the quash, resembling the ichneumon, which possesses a peculiarly fetid smell, and is known for its powerful, lacerating teeth. There are several species, also, of the armadillo, distinguished as the three-banded, eight-banded, and nine-banded. The paca is also very plentiful, and becomes easily domesticated. It reaches two feet in length, and its thick, clumsy form, of a dusky brown colour, may be seen scampering through the woods. The agouti, or Indian cony, or rabbit, frequents the same region as the paca, and is about the size of an ordinary hare. It does not, however, run in the same way, but moves by frequent leaps. The jaguar ranges through the whole of this part of the continent, and is remarkable for its large size and great strength. Not only does it frequently kill full-grown cattle, and drag them to its lair far-away in the woods, but, if irritated, it does not hesitate to attack human beings. The tiger-cat, or ocelot, which much resembles a common cat, but is considerably larger, is also found in the forest; but at the sight of man it takes to flight, and is, therefore, less frequently seen than its fiercer relatives. The puma also makes its way from one end of the country to the other; but though destructive to cattle, it is said here, as elsewhere, to fly from the face of man. The savage wolf, the cayote, is frequently met with.

A considerable number of the birds of South America, or of allied species, are found in many parts of the country. This is the home of the resplendent trogon, called the quetzal—the imperial bird of the Quiches. It, however, has but a limited range, being found only in the mountains of Merendon in Honduras, and in the department of Quezaltenango in Guatemala. There are numerous varieties of the parrot tribe, many of them of the most magnificent description with regard to their colouring. Here, also, the forests are adorned with the gay plumage of the red and blue macaws, as also by a toucan with a yellow tail. It is remarkable not only for its bright colour, but for its curious pendent nests, of which frequently fifty are seen hanging together from the branch of a single tree. Among the birds of prey, the ever-present turkey-buzzard and other vultures, hawks, owls, and sea-eagles, are common; as is the Mexican jay, the ring-bird, the rice-bird, swallow, and numerous varieties of humming-birds. Among the water birds are the pelican, the muscovy, and black duck; the spoon-bill, plover, curlew, teal, darter; while herons, ibises, and cranes, are found

in great numbers on the shores of the lagoons and rivers. In the interior of the country the splendid Honduras turkey, as well as the curassow, and several varieties of the wood-pigeon and dove, as also the partridge, quail, and snipe, exist in abundance.

Of the reptile tribes, alligators of great size are found in nearly all the lagoons and rivers. There is an infinite variety of lizards,—the most noted of which is the iguana, which frequently attains a length of four feet;—and its flesh is here, as in other parts of the continent, esteemed. There are many varieties of serpents, some of which are harmless. Of the venomous species, there are the golden snake, the whip-snake, and the tamagas—the bite of which is considered deadly. So is also that of the corral. It is of the most brilliant colour, covered with alternate rings of green, black, and red. To this last may be added the rattlesnake and the ordinary black snake. Most of these snakes are found in the lower region near the sea-coast.

In all the rivers and lakes, tortoises and turtles of several kinds are abundant. The land turtle reaches a foot in length. Its shell is of a dark colour. It is eaten, but is not esteemed of so good a quality as the sea turtle. The coasts are frequented by various species of sea turtle, known as the green, the hawks-bill—which affords the best tortoise-shell to commerce—and the trunk-turtle, which is larger than either of its two relatives. From its flesh is extracted a kind of oil, which is of considerable value.

The hawks-bill turtle, which gains that name from its narrow, sharp, and curved beak, like that of a hawk, is also called the imbricated turtle, because its scales overlap each other at their extremities, as tiles are placed on the roofs of houses.

The green or edible turtle is of great size, weighing often six hundred pounds, and being upwards of five feet in length. It gains its name from its rich fat, which is of a green colour; and its flesh is considered very much superior to that of all its relatives.

The variety and kinds of Crustacea are almost numberless, from the largest lobster to the smallest crab. Two species—the mangrove crab, and the white and black land crab—are found near the mouths of the rivers and in all the lagoons; while the curious soldier crabs, which seem as much at home in one element as in the other, inhabit in vast numbers the trees which lie rotting half submerged in the water. At certain times they may be found making their way into the interior, to return afterwards to the ocean.

The neighbourhood of the ocean, and the rivers and lakes of the interior, swarm with an endless variety of fish; while the huge manatee, or sea-cow, is found in most of the rivers.

The Mahogany-Tree.

The most valuable production of the forests of this part of the world is the mahogany-tree of Honduras, well-deserving, from its magnificent foliage and vast size, to be called the king of the forest. It is remarkably slow of growth, its increase during half a century being scarcely perceptible.

The life of the mahogany-cutter is wild in the extreme, yet he carries on his occupation in a systematic manner. Parties, or gangs, are formed, consisting of fifty men, with a captain, or hunter, attached to each. The business of the hunter is to search out the mahogany-trees fit for cutting. To do this, he makes his way through the thick forest to the highest ground in the neighbourhood he can find, and then climbs one of the tallest trees. From thence he surveys the surrounding country in search of the foliage, which presents a yellow, reddish hue, assumed by the mahogany-tree at that season of the year—about August. Having thus discovered a spot on which a number of the sought-for trees grow, he descends, and as rapidly as possible leads his party to it, lest any others on the search should be before them. Huts are now built, roofed with long grass, or the branches of the thatch-palm. His furniture consists of a hammock swung between two posts, and a couple of stones on which his kettle is supported. Stages, on which the axemen stand, are erected round the trees, which are cut down about ten or twelve feet from the ground. The trunk is considered most valuable, on account of the size of the wood it furnishes; but the branches are also of value, from their grain being closer and more variegated.

While one party is employed in cutting down the trees, another is engaged in forming a main road to the nearest river, with others from the various spots where the axemen are at work leading to it. This operation is concluded by the end of December. The trees are now sawn into logs of various lengths, and are squared by the axe, in order to lessen their weight, and to prevent them from rolling in the truck. When the dry weather sets in—about April or May—trucking commences. The trucks are drawn by seven pair of oxen. Each is accompanied by two drivers, sixteen men to cut food for the cattle, and twelve to load the trucks. In consequence of the hot sun during the day; trucking is always carried on at night. A wild scene is presented

while the trucks are moving from the forest, each accompanied by several men carrying torches, the drivers cracking their whips and uttering their shouts. Thus they go on till they reach the river's brink, when the logs—each marked with the owner's initials—are thrown into the water, and the trucks return for a fresh load. When the rains commence, the roads are impassable, and all trucking ceases.

As the rivers are swelled by the rains, the mahogany-logs are floated away, followed by the gangs in flat-bottomed canoes, called pit-pans. Their crews are employed in liberating the logs from the branches of the overhanging trees and other impediments, till they are stopped by a beam placed near the mouth of the river. The logs of each owner are now collected into large rafts, in which state they are floated down to the wharves of the proprietors. Here they are newly smoothed, and made ready for shipping to England.

Many other valuable woods come from this region. Rosewood is common on the northern coast of Honduras. The bushes which produce gum-arabic abound in all the open savannahs on the Pacific slope. In the forest is found the copaiba-tree, producing a healing liquid. Here also are found the copal-tree, the palma-christi, the ipecacuanha—the root of which is so extensively used in medicine—the liquid amber, as well as caoutchouc. Here the vast ceiba, or silk-cotton-tree, is abundant, from which canoes are frequently hollowed out. Indeed, a considerable number of the trees found on the banks of the Orinoco and Amazon here also come to perfection.

Humming-Birds:—The Slender Shear-Tail.

Central America is the home of several beautiful species of those minute members of the feathered tribe—the humming-birds. Among them is found the slender shear-tail, which will be known by its deeply-forked black tail, its wings of purple-brown, and its body of deep shining green, changing to brown on the head, and bronze on the back and wing-coverts. The chin is black, with a green gloss; the throat is of a deep metallic purple; while a large crescent-shaped mark of buff appears on the upper part of the chest. There is a grey spot in the centre of the abdomen, and a buff one on each flank, the under tail-coverts being of a greenish hue.

The female differs greatly from her consort. Her tail is short, the central feathers being of a golden green; the exterior ones rusty-red at their base, and black for the greater part of their

length, with white tips. The upper part of her body is also of a golden green; the lower of a reddish-buff.

The Rufus Flame-Bearer.

The beautiful little rufus flame-bearers belong to the genus *Phaethornis*. They are known by their long, graduated tails, all the feathers of which are pinnated—the two central ones extending far beyond the others. “They may be seen early in the year, darting, buzzing, and squeaking in the usual manner of their tribe, engaged in collecting sweets in all the energy of life, appearing like breathing gems—magic carbuncles of glowing fire—stretching out their glorious ruffs, as if to emulate the sun itself in splendour. The female sits towards the close of May, when the males are uncommonly quarrelsome and vigilant, darting out as the stranger approaches the nest, looking like angry coals of brilliant fire, returning several times to the attack with the utmost velocity, at the same time uttering a curious, reverberating, sharp bleat, somewhat similar to the quivering twang of a dead twig, and curiously like the real bleat of some small quadruped. At other times the males may be seen darting high up in the air, and whirling about each other in great anger and with much velocity.

“The nests are funnel-shaped, measuring about two and a quarter inches in depth, and one and three-quarters in breadth at the upper part, composed of mosses, lichens, and feathers woven together with vegetable fibres, and lined with soft cotton.”

This description is given by Mr Nuttall the naturalist, and quoted by Audubon.

Princess Helena’s Coquette.

This beautiful little gem—a native of Vera Paz, in Guatemala—is adorned somewhat after the fashion of the Birds of Paradise, its head being ornamented with six long, green, hair-like feathers, three on either side of the body. The upper part is of a coppery bronze colour, a band of buff crossing the lower end of the back. The face is green; and the throat is adorned with emerald feathers surrounded with others long and white. These start from the neck, being edged with blue-black. Beautifully adorned as is the male, the hen-bird possesses neither crest nor neck-plumes, her colour being of a dull, bronze-green, and greyish-white sprinkled with green on the under part of the body.

The Sparkling-Tail Humming-Bird.

The little sparkling-tail is one of the boldest and most familiar of its tribe, being seen flitting from flower to flower among the gardens in Guatemala, and remaining with perfect confidence even while people are moving about near it. It is one of the smallest of its tribe—the nest being also of a proportionate size, formed of various delicate fibres, such as spider's webs and cottony down, and covered with lichens. Within it the female lays two eggs, scarcely larger than peas, of a delicate, almost transparent, pearly white. This nest is secured to a slight twig by spider's webs.

The general colour of the male is bronzed green above, with a crescent-shaped white mark on the lower part of the back. It has a rich metallic blue throat, changing in certain lights; and the wings are of a dark purple-brown. The tail is composed of feathers of different tints—the two central of a rich, shining green; the next, green, marked with bronze; and the outer, dark brown, with triangular white spots on the inner web.

The whole length of the bird, with its forked tail, is about four inches. The hen has a shorter tail, the feathers purple-black, bronzed at the base, and most of them tipped with white and ringed with buff. The upper part of the body is of a rich bronzed green; and the lower, a rusty-red.

Many other beautiful humming-birds appear throughout different parts of Mexico and Central America; but we may grow weary even when examining caskets of the most brilliant gems; and we shall have many others to describe when we reach the southern part of the continent.

Locusts.

Insect life is as active in Central America as in other parts of the tropics. The most dreaded insect is the locust, which makes periodical attacks on the plantations, and in a single hour the largest fields of maize are stripped of their leaves, the stems alone being left to show that they once existed. This creature is called by the natives the "chapulin," or langosta. They make their first appearance as little wingless things, swarming over the ground like ants, when they are called "santones." In order to destroy them, the natives dig long trenches, into which they are driven, when, unable to leap out, they are easily buried and destroyed. Still, vast numbers escape, when they appear in enormous columns, darkening the air, and as they sweep

onwards, destroy every green thing in their course. They cover the ground on every side, then rising in clouds, fill the atmosphere with their multitudes, causing the trees to appear brown, as if seared by fire. Frequently, as their hosts sweep onwards, they are seen falling like flakes in a snow-storm from a dark cloud. Every device that the farmer can think of is employed to prevent their settling: sulphur is burned, drums beaten, guns fired, and other noises made. Often, by such means, a plantation is preserved from destruction; but when the columns once alight, no device avails to save the plantation from speedy desolation.

This locust or grasshopper is generally from two and a half to four inches in length, but specimens sometimes appear five inches long; and it may be conceived what an enormous amount of food such monsters must consume.

Part 2—Chapter III.

Ruins of Central America.

In all parts of Central America are found numerous signs that the country was, in bygone days, inhabited by a numerous population far more advanced in civilisation than the tribes which peopled it when first discovered by Columbus and his companions. In Yucatan and Chiapas, especially, ruins of numerous houses exist, with elaborately carved monuments and large buildings, bearing a remarkable resemblance to those of Egypt and Babylon. Throughout Nicaragua and other districts many remains—such as tombs, monuments, and edifices—are found, as well as carved rocks, which were probably the work of a people of still greater antiquity than those who inhabited the first mentioned region.

Dr Seeman describes some rocks near the town of David, in Chiriqui, on which characters are engraved similar, or indeed absolutely identical, with inscriptions which have been found in the northern parts of the British Islands. The rock is fifteen feet high, nearly fifty feet in circumference, and rather flat on the top. Every part—especially the eastern portion—is covered with incised characters about an inch or half an inch deep. The first figure on the left hand side represents the radiant sun, followed by a series of heads with some variation. These heads show a certain resemblance to one of the most curious characters found on the British rocks. They are followed by scorpion-like and

other fantastic figures. The tops of the stones on either side are covered with a number of concentric rings and ovals, crossed with lines. He considers them to be symbols full of meaning, and recording ideas held to be of vital importance to the people who used them, and whose names have become a matter of doubt.

In the district of Chontales, a vast number of ancient tombs are met with in almost every direction. They are found in plains having a good drainage, such as was generally selected by the Indians for the sites of their villages. These tombs are of different heights and sizes. Some are about twenty feet long by twelve feet wide, and eight feet above the ground. In one which was opened was found a round pillar seven feet high and eighteen inches across, which was standing upright in the centre of the tomb. There was a hand-mill for grinding corn—in shape like those still in use in the country—a knife ten inches long, a hatchet like a reaping-hook, and a tiger's head of natural size,—all of stone. In some instances gold ornaments have been found, but not in sufficient numbers to induce the people to destroy the relics.

The Indians inhabiting Nicaragua in ancient days did not apparently construct any large temples or stone buildings, as some other natives of Central America have done. They, however, formed stone figures of considerable size, which remind us greatly of those which exist in Easter Island in the Pacific. These stone figures, often of colossal dimensions, are of two different descriptions—the one having a mild, inoffensive expression of countenance; while the others, presenting a combination of both human and animal, have invariably a wild, savage look, apparently for the purpose of terrifying the beholders. The first, it is supposed, are the idols which the ancient Nicaraguans worshipped before the Aztec conquest of their country; while the latter were introduced when the people had been taught to engage in the bloody rites practised by the Mexicans.

These stone monuments, though similar, as has been remarked, to those of Easter Island, and to others found far-away across the Pacific, are strong corroborative proofs that America was first peopled by tribes who made their way by various stages from the continent of Asia, though, at the same time, that long ages have passed away since they first left that far-distant region—the cradle of the human race. The Indian priests, like the Druids of old, appear to have chosen the hill-tops and

mountainsides, shady groves and dark ravines, for the sites of their temples or places of worship.

From the midst of Lake Managua, in Nicaragua, rises the volcanic island of Momotombita, towering in a perfect cone towards the blue sky. In the midst of a natural amphitheatre on the slope of the mountain were discovered a large number of statues (fifty or more), arranged in the form of a square, their faces looking inwards. Many were cast down, but others stood erect, though all apparently had been more or less purposely mutilated. Some of the figures represent males, but others are undoubtedly those of females. They are cut in black basalt of intense hardness. The features of the face of one, which has been conveyed to the Museum at Washington, are singularly bold and severe in outline. The brow is broad, the nose aquiline, while the arms and legs are rudely indicated. Other curious idols have been dug up in the neighbourhood of the town of Leon. The Spanish priests, anxious to put down the ancient idolatry from the time of their arrival in the country, have taken pains to destroy these idols, and many have been mutilated and others buried by their orders.

In the island of Zapetero, rising out of Lake Nicaragua, there are a still greater number of statues—some from eight to twelve feet in height, and others of still greater magnitude—elaborately carved out of hard stone. Sometimes they are placed round mounds which have evidently served the purpose of altars, on which human sacrifices probably were offered. One of the most interesting which has been brought to light is twelve feet high, sculptured from a single block, and representing a human figure seated on a high pedestal, the stone at the back of the head being cut in the form of a cross. The limbs are heavy, and the face large and expressive of great complacency.

Some of the idols represent an animal, apparently a tiger, springing upon the head and back of a human figure. One—also at the Washington Museum—represents a man squatted on his haunches, with one hand at his side, and the other placed on his breast. The head is erect, and the forehead encircled by a fillet, much carved. The features are unlike most others—indeed, it seems as if each one had its individual characteristic. A jaguar appears on the back of this statue, its fore-paws resting upon the shoulders, and its hind ones upon the hips, while it grasps in its mouth the back part of the head of the figure.

Although many of the figures represent human beings, others are those of animals. One, a jaguar, is seated on its haunches,

the head thrown forward, the mouth open,—the attitude and expression being that of great ferocity. It is very boldly sculptured. Another, a very well proportioned human figure, is seated on a square throne raised five feet from the ground. It is remarkable for having on its head another monstrous head, representing some fierce animal. The heads of several of the idols are thus surmounted. These symbolical heads were probably introduced with the same object as those which were so general among the Egyptian idols.

In the midst of this collection of idols are two or more oblong stones, on the sides of which are hieroglyphical inscriptions. In the centre are hollow places, probably designed to receive the blood of the victims.

It is remarkable that the heads of many of the figures are surmounted with cross-shaped ornaments similar to the one discovered at Palenque by Mr Stevens. One of these crosses—which no doubt had their origin in Babylon, where they are well-known symbols—was set up by the Spaniards in the convent-church of Tonalá, and there venerated.

The Mexicans possessed a symbol called the *Tonacaquahutl*, or “tree of life,” which was represented with branches somewhat in the form of a cross, surmounted by a bird. This symbol also appears on a tablet discovered by Mr Stevens at Palenque. In various parts of the country terra cotta figures have been dug up. Some of them are rude, but others are extremely artistic; and though not equally graceful, resemble much, in the form of the limbs, many Egyptian figures. Among them is a figure from the island of Ometepe, which represents an alligator upon the back of a human figure, which apparently originally surmounted a large vase.

Mounds similar to those found in the valley of the Mississippi have been discovered in Honduras. But by far the most interesting remains are those of Palenque, in Chiapas; of Copán, in Honduras; and of Uxmal and Chi-chén, in Yucatán. Here are extensive ruins of cities, containing the remains of pyramids, and the walls of massive buildings, broken columns, altars, statues, and numberless sculptured fragments, showing that a large population inhabited this country, and that the people had attained a considerable knowledge of the arts, though, at the same time, they seem to have been sunk in the grossest idolatry.

In the western part of Honduras, adjoining the province of Guatemala, are extensive ruins, which stretch for more than

two miles along the banks of the river Copan. The outer walls, which run north and south along the margin of the stream, are from sixty to ninety feet high; while other walls, of a similar character, surround the principal ruins. Within these walls are extensive terraces and pyramidal buildings, massive stone columns, idols, and altars covered with sculpture. The numerous terraces and pyramids are also walled with cut stone, and ornamented with carved heads of gigantic proportions, and colossal idols of solid stone from ten to fifteen feet in height. The altars in front of the statues are of single blocks of stone, many of them richly carved, but all differing from each other. One of the most remarkable altars stands on four globes cut out of the same stone. It is six feet square and four feet high, its top covered with hieroglyphics, while each side represents four individuals. The figure is sitting cross-legged, in the Oriental fashion, and the head-dresses are remarkable for their curious and complicated forms. All have breastplates, and each holds some article in his hand.

From these carvings we read, though indistinctly, some of the characteristics of the people. From the absence of all weapons of war, however, we may suppose them peaceable, though grossly idolatrous, and, from being unwarlike, easily subdued.

On entering the town, after some adventures, Mr Stevens made his way to an area, which he ascertained to be a square, with steps on all sides, almost as perfect as those of the Colosseum. He ascended the steps, which were ornamented with sculptures, till he reached a broad terrace, one hundred feet in height, overlooking the river. The whole terrace was covered with trees, among which were two gigantic cotton-trees of about twenty feet in circumference, extending their roots fifty to one hundred feet round, and which had, in many places, displaced the stones. Among other ornaments were rows of gigantic heads, which, no doubt, were intended to represent those of apes; for amongst the fragments were the remains of the body of a colossal ape, strongly resembling in outline and appearance one of the four monstrous animals which once stood in front of the obelisk of Luxor, and which, under the name of Cynocephali, were worshipped at Thebes. This fragment was about six feet high.

No verbal description can give a correct idea of the elaborate workmanship of the numberless idols. One, described by Mr Stevens as the most beautiful in Copan, he considers equal to the finest Egyptian sculpture; and thinks, indeed, it would be impossible, with the best instruments of modern times, to cut

stones more perfectly. They are generally from twelve to fourteen feet in height, about four wide, and two or three deep. On the front is, in all cases, a human head, with arms and hands, surrounded by the most intricate carving. Frequently other smaller heads appear below the large one. In many instances the legs and feet, as well as the body, are represented. The backs and sides are covered with the most elaborate hieroglyphics, deeply carved—the whole forming a mass of rich ornamentation. Before several of the idols stand altars, also carved in the same finished way.

The most interesting figure—which, unlike all the others, is remarkable for its simplicity—is that of a human being, bearing on its head a heavy cross-like crown. It cannot fail to remind those acquainted with the idols of Babylon of the Triune God represented in the sculptured stones of those far-famed ruins.

Stone Quarries.

Some two or three miles from the ruins are the quarries, from which the stones for the buildings and statues of Copan are evidently taken. Here still exist huge blocks of stone, in different degrees of preparation. Near a river was found a gigantic block, much larger than any in the city, which was probably on its way thither, to be carved and set up, when the labours of the workmen were arrested. It is difficult to conjecture how these vast masses were transported over the irregular and broken surface of the country, and particularly how one of them was set up on the top of a mountain two thousand feet in height.

A place of this name was captured by Hernandez de Chaves at the time when its now broken monuments, ruined terraces, walls, and sculptured figures, were entire, and were all richly painted; and it seems strange that Europeans could have beheld its wonders without spreading the report of them throughout the civilised world, yet no account of this strange city was extant till it was visited by Mr Stevens.

Palenque.

Still more curious and interesting than the last described city, are the ruins of Palenque, in the province of Chiapas, bordering upon Yucatan. One of the chief structures of this ancient city stands on an artificial elevation 40 feet high, 310 feet in length, and 260 feet in width. The sides were originally covered with stones, which have been thrown down by the growth of trees. On the summit are the ruins of a building, known as the Palace,

about 25 feet in height, with a front measuring 228 feet by 180 feet deep. In front were, originally, fourteen doorways, with intervening piers, covered with human figures, hieroglyphics, and carved ornaments. The walls are of stone, laid with mortar and sand; and the whole is covered by stucco, nearly as hard as stone, and richly painted. On each side of the steps are gigantic human statues carved in stone, with rich head-dresses and necklaces.

In one of the buildings is a stone tower of three stories, thirty feet square at the base, and rising far above the surrounding walls. The walls are very massive, and the floors are paved with large square stones. In one of the corridors are two large tablets of hieroglyphics.

There are numerous other buildings, all standing on the summits of similar pyramids. In several of the buildings the roofs still remain, and preserve the stuccoed ornamentation with which the walls are adorned. The colours, in many of them, are still bright; and could the hieroglyphics with which they are surrounded be read, they would probably give as clear a history of the departed inhabitants as do those found in the tombs on the banks of the Nile. The most remarkable figures are the bas-reliefs, in stucco, representing a woman with a child in her arms—which forcibly remind us of the statues in ancient Babylon representing the goddess mother and son (the same worshipped in Egypt under the names of Isis and Osiris; in India, even to this day, as Isi and Iswara; and also in China, where Shingmoo, the holy mother, is represented with a child in her arms, and a glory round her head). It is impossible, looking at these figures, to suppose otherwise than that they were derived from the same source whence the idols of Egypt, Greece, and pagan Rome had their origin.

Ruins of Quiché.

In the north-east of Guatemala are the ruins of another city, the capital of the province of Quiché. It is surrounded by a deep ravine, which forms a natural foss, leaving only two very narrow roads as entrances, guarded by the castle of Resguado. The palace of the kings, which stood in the centre of the city, surpasses every other edifice, competing in magnificence with that of Montezuma in Mexico. It was constructed of hewn stones, of various colours. So large was the city, that it could send no less than seventy-two thousand fighting men to oppose the Spaniards. The whole palace is now, however, completely destroyed, and the materials have been carried away to build a

village in the neighbourhood. The most conspicuous portion of the ruins remaining is called El Sacrificatorio. It is a quadrangular stone structure, rising in a pyramidal form to the height of thirty-three feet. At the corners are four buttresses of cut stone. Steps lead up on the eastern side. On the top it is evident that an altar was once placed, for the sacrifice of human victims, which struck even the Spaniards with horror. The whole was in full view of the people who collected round the base. The ruins differ entirely from Copan and Palenque. Here no statues, carved figures, or hieroglyphics are seen. It is therefore supposed that these cities are of a much older date, and built by another race.

Uxmal.

The most magnificent and perfect remains in the country are those of Uxmal, about fifty miles south of Merida, the principal city of Yucatan. Here, amid the dense forest, are found walls of considerable elevation, with very extensive buildings,—the walls still standing to their full height, and even the roofs, in some places, perfect. The largest building—supposed to be the palace of the sovereign—stands on the uppermost of three terraces, each walled with cut stone. It is 322 feet in length, 39 broad, and 24 high. The front has thirteen doorways; the centre of which is 8 feet, 6 inches wide, and 8 feet, 10 inches high. The upper part is ornamented with sculpture in great profusion, of rich and curious workmanship. The walls are covered with cement; and the floors are of square stones, smoothly polished, and laid with as much regularity as that of the best modern masonry. The roof forms a triangular arch, constructed with stones overlapping, and covered by a layer of flat stones. It is remarkable that the lintels of the doorways are of wood, known as Sapote wood. Many of them are still hard and sound, and in their places; but others have been perforated by wormholes, their decay causing the fall of the walls.

Two other large buildings, facing each other, are embellished with sculpture, the most remarkable features of which are two colossal serpents, which once extended the whole length of the walls. Further on are four great ranges of edifices, placed on the uppermost of three terraces. The plan of these buildings is quadrangular, with a courtyard in the centre. The walls are, like the others, ornamented with rich and intricate carving, presenting a scene of strange magnificence. One of the buildings is 170 feet long, and is remarkable for the two colossal entwined serpents which run round it, and encompass nearly all the ornaments throughout its whole length. These serpents are

sculptured out of small blocks of stone, which are arranged in the wall with great skill and precision. One of the serpents has its monstrous jaws distended; and within them is a human head, the face of which is distinctly visible in the carving.

The most tastefully ornamented edifice is known as the "House of the Dwarf." It stands on the summit of a lofty mound, faced with stone, nearly ninety feet high, the building itself being seventeen feet high. Its purpose it is difficult to divine.

Scattered throughout the ruins are a number of dome-shaped subterranean chambers, from eight to ten feet deep, and from twelve to twenty in diameter. The floor is of hard matter, and the walls and ceilings of plaster. A circular hole at the summit of each, barely large enough to admit a man, is the only opening into them. It is not known whether they were used as cisterns, or for granaries, like those of Egypt.

Other Ruins.

The whole country to the south of Uxmal is covered with ruins. At a place called Labra, there is a tower richly ornamented, forty feet in height, which stands on the summit of an artificial elevation. In another place there is one forty-five feet high; along the top of which, standing out from the wall, is a row of deaths' heads—or perhaps monkeys' heads—and underneath are two lines of human figures, greatly mutilated.

At Kewick, a short distance from Labra, are numerous other ruins, mostly remarkable for the simplicity of their architecture and the grandeur of their proportions. It is still uncertain whether these cities were inhabited by the unhappy people conquered by the Spaniards, or whether they were built by a race which, from some unknown cause, had already passed away. We see how completely the Mexicans and Peruvians, after the conquest, sunk from their comparatively high state of civilisation into barbarism; and such might have been the case with the inhabitants of these cities. Their origin will probably for ever afford matter for speculation.

The different cities vary in their style of architecture almost as much as they do from those of Assyria or Egypt; but when we come to examine the sculptures, we may be able to trace a much stronger resemblance. The statues of the woman and child, the cruciform ornaments, the serpents and gigantic heads of apes, as well as those of the typical heads of savage animals surmounting the heads of the statues, are all to be found on the

banks of the Nile, and were probably derived from the same central source. While the tribes who proceeded westward peopled Egypt, others, among whom a similar system of idolatry prevailed, may have migrated towards the east, and finally made their way across the Pacific to the shores of America.

Part 3—Chapter I.

South America.

Scenes of Ancient Days.

Time was when a rocky island, against which dashed the surges of the Atlantic on the east and of the Pacific on the west, rose in solitude from the wide-extending ocean where now the highlands of Guiana appear above the surrounding plains. Not another spot of dry land was to be found—so geologists affirm—between that point and the hills of Canada on the north, or for thousands of miles southward towards the pole, over that portion of the globe's surface now occupied by the vast continent of America. Then, by slow degrees, the mountains of Brazil, with their mines of glittering gems, appeared above the surface of the waters, amid which huge reptile-like whales, ichthyosaurs, plesiosaurs, and cetiosaurs buffeted the billows, and vast saurians, lizards, and alligators, rivalling the elephant in bulk, and twice his length—such as the megalosaurus, the iguanodon, and teleosaurus—crawled along the slimy shores; while giant birds, with wide-spreading feet, stalked across the newly-formed plains, or flew shrieking, with wings of prodigious expanse skimming the glittering sea,—the lords paramount of this lower world. At length the earth, convulsed by mighty throes in the far-away west from north to south, began to cast up a long line of rocky heights, now to sink, now to rise once more above the surface,—till by degrees Pelion piled on Ossa—the vast chain of the Cordilleras rose towards the skies, forming a mighty barrier between the two great oceans.

On the eastern side, the waves of the Atlantic, beating continuously, brought down into the shallow sea the débris from the newly-formed rocks, gradually filling up the spaces between the already created islands; and the streams, running down from the mountain heights, formed the plan of the three great river-systems of the continent—the Orinoco in the north, the Amazon in the centre, and La Plata in the south.

The Almighty Creator appears always to have worked by mechanical means in preparing the globe for the habitation of man. There came then a glacial period. Ponderous blocks of ice, resting not only on the mountainsides, but extending over the plains, and acting the part of mighty mill-stones, ground into impalpable powder the pieces of detached rock of which the lower surface was composed, till a soil was formed capable of producing a wondrous and varied vegetation to clothe that Amazonian valley.

(The continent, Professor Agassiz supposes, extended at that time between 200 and 300 miles further east than it does at present; but the waters from the rapidly-melting mass of ice, forcing a passage towards the ocean, carried a large portion away, leaving only certain tracts which now appear in the form of islands at the mouths of the Amazon and Orinoco.)

The work has been accomplished—the land prepared for its future inhabitants! Mighty torrents fall from the lofty mountains, meandering through the vast Amazonian plain. The age of winter has passed away. The earth, warmed by the fires beneath and the hot sun above, steams with vapour. Lofty trees rise from the alluvial soil. A dense mass of underwood springs up; creepers innumerable hang from the boughs; countless multitudes of insects have been called into existence—termites, ants, and beetles—feeding on the leaves and herbage, and on the giant trunks themselves. It might seem, numerous and voracious as they are, that they must quickly destroy the clothing of verdure which covers the soil. But they are not destined thus to triumph over the wonderful work of the Creator's hand.

A law has been framed by which all things are beautifully and wonderfully balanced. Monstrous animals have been created to place bounds on their too great increase. Huge, awkward-looking beasts covered with shaggy hair, with thick, short limbs, and powerful, sharp claws bent inwards on soft pads—compelling them to move on the edge of their paws—are busy with the clay-formed nests of the insects, dashing them asunder, and devouring their active builders—taking in whole armies at a mouthful.

See yonder huge creature, its body the size of a rhinoceros, covered with a coat of armour, a convex oval shield, formed of hexagonal plates wonderfully fitted to each other! It is an armadillo, the precursor of a race still abounding in the land, though of diminutive form compared to its mighty predecessor. See how, with powerful jaws, it crunches up a fallen tree,

perforated through and through by ants,—grinding the papery partitions of the dry wood, licking in and chewing between its wonderful cylinder teeth the whole mass into a black pulp!

"But lo! here are mightier creatures yet. See the vast mylodon, the scelidother, and the still more colossal megathere! Ponderous giants these. The very forests seem to tremble under their stately stride. Their immense bulk preponderates behind, terminating in a tail of wonderful thickness and solidity. The head is mean, and awakens no terror. The eye lacks lustre, and threatens no violence, though the whole form betokens vast power; and the stout limbs are terminated by the same thick, in-bent, sharp, hoofed claws. One of them approaches that wide-spreading locust-tree. He gazes up at the huge mud-brown structures that resemble hogsheads affixed to the forks of the branches, and he knows that the luscious termites are filling them to overflowing. His lips water at the tempting sight. Have them he must; but how? That heavy stern-post of his was never made for climbing. Yet, see! he rears himself up against the tree. Is he about to essay the scaling? Not he. He knows his powers better. He gives it one embrace—one strong hug, as if to test its thickness and hold upon the earth. Now he is digging away below, scooping out the soft soil from between the roots; and it is marvellous to note how rapidly he lays them bare with those great shovel-like claws of his. Now he rears himself again; straddles wide on his hind-feet, fixing the mighty claws deep in the ground; plants himself firmly on his huge tail, as on the third foot of a tripod, and once more grasps the tree. The enormous hind-quarters, the limbs and the loins, the broad pelvis and thick spinal cord, supplying abundant nervous energy to the swelling muscles inserted in the ridged and keeled bones, all come into play as a *point d'appui* for the Herculean effort." (Gosse's "Natural History.")

"And now conceive the massive frame of the megathere convulsed with the mighty wrestling, every vibrating fibre reacting upon its bony attachments with the force of a hundred giants. Extraordinary must be the strength and proportions of the tree if, when rocked to and fro to right and left in such an embrace, it can long withstand the efforts of its assailant. It yields! The roots fly up. The earth is scattered wide upon the surrounding foliage. The tree comes down with a thundering crash, cracking and snapping the great boughs like grass. The frightened insects swarm out at every orifice, but the huge beast is in upon them. With his sharp hoofs he tears apart the crusty walls of the earth-nests, and licks out their living contents—fat pupae, eggs, and all—rolling down the sweet

morsels, half sucking, half chewing, with a delighted gusto that repays him for all his mighty toil. While this giant is absorbed in his juicy breakfast, see! there lounges along his neighbour the macrauchen—equally massive, equally heavy, equally vast, equally peaceful. The stranger resembles the huge rhinoceros, elevated on much loftier limbs. But his most remarkable feature is the enormously long neck, like that of the camel, but carried to the altitude of that of the giraffe. Thus he thrusts his great muzzle into the very centre of the leafy trees, and gathering with his prehensile and flexible lip the succulent twigs and foliage, he too finds abundance of food for his immense body in the teeming vegetation without intruding on the supply of his fellows.” (Owen on the “Mylodon.”)

Emerging from the water appears a great head, with little piggish eyes set wide apart, with immense muzzle and lips, and broad cheeks armed with stiff projecting bristles—the sluggish toxodon. The creature opens its cavernous mouth to seize a floating gourd; and now it tears up the great fleshy arum roots from the clay bank, and grinding them to pulp, sinks below to masticate its meal. Numberless other curious creatures are roaming through the forest, or feeding on the banks; many others, having run their destined course, disappear from the face of the globe, to be replaced by a new creation of far less magnitude—the mild llama, the savage jaguar, the nimble monkey with prehensile tail, the ant-eater, arboreal and terrestrial; the diminutive sloth, thick-skinned tapir, alligators, turtles, and manatees; lizards, serpents; the beautiful denizens of the air with superb plumage, numerous species of humming-birds, gorgeous butterflies and beetles, vieing in their shining hues with the rich gems hidden within the bowels of the earth.

It is of these, and of many others in wonderful variety; as well as of their master—man—in his savage state; and of the curious trees and shrubs, whose fruits afford him and the lower orders abundant nourishment, that some outline sketches will now be given.

Part 3—Chapter II.

A General View of South America.

Three separate mountain-systems exist in South America:—that of the Andes on the west, Guiana and Venezuela on the north, and the serras of Brazil in the centre. The surface of the

remainder of the continent is occupied by vast level, or undulating tracts of different elevations. The chief portion of the region through which the Amazon flows, but slightly raised above its surface, is covered with the richest and most varied vegetation to be found on any part of the globe, extending on either side of its course, as also along the shores of the Atlantic, north and south, for many hundreds of miles. Here enormous trees of many descriptions, of varied shapes and heights, grow in wonderful profusion. The candelabra, sumauméra, the manicaria, and raphia, with their enormous leaves, and other palms innumerable, tower towards the sky. To the south of the Orinoco is another thickly-wooded region, known as the Silvas; which, united to the woods of Guiana and those of Brazil, Eastern Peru and Bolivia, form one enormous forest. From the north bank of the last-named river, the ground gently rises towards the interior at the rate of five feet in a mile. At a distance of one hundred miles from its banks, at a slightly increased elevation, appears a sandy terrace—the greater portion barren, though in some places bearing grasses, and supplying water to the wide-extending plains below. This barren region, which occupies the most northern part of South America, is called the Llanos Altos. A far wider and more level country extends between the base of the Andes and the banks of the Orinoco, at a height of between two hundred and five hundred feet. Not a stone or rock, not even a pebble, is to be seen on these vast plains. So level are they, that the currents of the rivers crossing them are almost imperceptible, and are frequently sent back towards their sources when met by strong winds. They are covered with grass, which affords pasturage to large herds of wild cattle—the only other species of vegetation being a few bushes growing on the banks of the streams; while here and there, scattered at considerable distances apart, a few tall palm-trees are seen, reminding the traveller of the deserts of Arabia.

In the southern part of the continent are the treeless plains of the Pampas, extending from about 20 degrees south latitude for a distance of fully two thousand miles into Patagonia, and averaging in width five hundred miles. Stretching, as do these plains, across a large portion of the South Temperate Zone, they present great varieties of climate. The northern portion is watered by the River La Plata and its tributaries. To the south of Buenos Ayres the rivers are fewer and of less extent. The north-western Pampas consist of slightly undulating and dry plains, though interspersed with vast tracts on which lofty thistles rear their heads—useful, however, as fuel to the inhabitants. Further on, to the west, is a wide-extending pastoral district; and yet

beyond, reaching to the foot of the Cordilleras, the soil is well-suited for agriculture. The pastoral region is almost a dead level, with large shallow salt-lakes,—one of them measuring fifty miles in length by twenty in width. Scarcely a tree is to be found throughout this region, and but few permanent water-courses. To the north extends a salt desert for upwards of one hundred miles, with a width of two hundred miles. It is crossed by the River Salado, which, rising in the Cordilleras, falls into the Plata, to the south of which rises a number of step-like terraces, sterile during the heats of summer, but covered with verdure after the rains of spring. Huge boulders, brown grass growing in tufts, and low spine-covered bushes, diversify the surface. In this inhospitable region transitions from heat to cold are very great. Now the traveller is panting under the intense heat of the sun's rays; and anon an icy blast rushes across the plain, compelling him to draw close around his body his thick poncho, for protection against its chilling influences.

Further to the south are found large swamps and lagoons, one of them having an area of one thousand square miles, its surface covered with aquatic plants. In the rainy season, the rivers, overflowing their banks, inundate the plains—leaving behind, however, a thick deposit of fertilising soil, from which, as elsewhere, rich crops are capable of being produced. Further on, to the south, the Pampas, over which the yet savage and untamed Patagonians roam, and hunt the huanacu and ostrich, is generally higher and drier.

The South American continent, it will thus be seen, consists of several distinctly different descriptions of country:—the long line of the Cordilleras, with their snow-capped peaks and their lofty punas or high table-lands, and the narrow strip of arid soil at their western base; the three separate mountain-systems of Venezuela, Guiana, and the Brazils; the mighty forests bordering the great rivers and their tributaries, to which must be added the wooded heights of the inter-tropical regions, where tall trees, including several palms, flourish at an elevation of many thousand feet above the level of the ocean; and lastly, the wide-extending regions of the Llanos and the Pampas. These, as might be supposed, present great varieties of animal life—though scarcely so great as might have been expected, when it is remembered that they extend from 10 degrees north to 50 degrees south latitude. Several species indeed are found far to the north of the equator, and also near the southern end of the continent. But to give an idea of these different regions, they must be described in detail.

Part 3—Chapter III.

Valley of the Amazon.

Standing on the eastern spur of the Andes, between 3 degrees and 4 degrees south of the equator, the eye of the traveller may see in imagination a vast valley, clothed with a dense forest, stretching towards the far-distant Atlantic. Behind him, on the west, tower the lofty peaks of the Cordilleras; on his left, in a northerly direction, appear the mountains and highlands of Venezuela and Guiana; while to the south rise the serras and table-lands of the Brazils. It is the Valley of the Amazon, in which more than half of Europe might be contained. Down the centre flows a mighty stream, the tributaries of which alone contain a bulk of water greater than all the European rivers put together.

Upwards of five hundred miles away to the south of the spot where the traveller stands, is the little lake of Lauricocha, near the silver-mines of Cerro de Pasco in Peru, just below the limit of perpetual snow—14,000 feet above the level of the sea. This lake has the honour of giving birth to the mighty stream: its waters forming the River Tunguragua, which, roaring and foaming in a series of cataracts and rapids through rocky valleys, flows northerly till it reaches the frontier of Ecuador. It then turns suddenly to the east, which direction it maintains, with a slightly northerly inclination, for two thousand miles—its volume greatly increased by numerous large streams, each of which is by itself a mighty river—till, attaining a width which may vie with that of the Baltic, it rushes with such fierce force into the Atlantic as to turn aside on either hand the salt-waters of the ocean. Thus the seaman approaching the shore of South America, when still out of sight of land, may lower his bucket and draw up the fresh-water which, it may be, has issued forth weeks before from the sides of the Andes. The whole length of the river, following its main curves, is but little under three thousand miles, while the tributaries from north to south stretch over seventeen hundred miles.

The basin of the Amazon may be considered like a shallow trough lying parallel to the equator, the southern sides having double the inclination of the northern, the whole gently sloping eastward. The channel of the river lies rather to the north of the basin, some hills rising directly above its waters; while the falls of several rivers to the south are two hundred miles above their

mouths. Two thousand miles from its mouth the depth of the river is never less than eighteen feet, while many of its tributaries at their embouchures are of equal depth; and at the junction of the great rivers the hollows of its bed attain a depth of twenty-four fathoms. At Tabalingua, two thousand miles from its mouth, it is a mile and a half broad; and lower down, at the entrance of one of its tributaries—the Madeira—it measures three miles across. Still further to the east its sea-like reaches extend to the north for ten miles, with still wider lake-like expanses, so that the eye of the voyager can scarcely reach the forest-covered banks on the opposite side; while if the River Para is properly considered one of its branches, its measurement from shore to shore, across a countless number of islands, is one hundred and eighty miles—equal to the breadth of the widest part of the Baltic.

After receiving the waters of numerous streams, many of which flow for considerable distances parallel with its shores, and are united by a network of channels, it is joined by its most considerable northern tributary—the Rio Negro. This stream, rising in the mountains of Venezuela, and passing amidst the Llanos, robbing the Orinoco of part of its waters, has already, before it reaches the Amazon, flowed for a course of one thousand five hundred miles. It is called the Negro from its black colour. It is here not less than nineteen fathoms deep, and three thousand six hundred paces broad. The next great affluent is the Yapura, which, rising in the mountains of New Granada, takes a south-easterly course for one thousand miles, its principal mouth entering the Amazon opposite the town of Ega; but it has numberless small channels, the streams of which, two hundred miles apart, flow into the great river. The upper part of the Amazon is frequently called the Solimons, which name it retains as far south as the mouth of the River Negro.

About sixty miles further east, its largest southern affluent—the gigantic Madeira—unites its milky waters with the turbid stream of the main river. One branch, the Beni, rises in the neighbourhood of the ancient Cuzco in Peru, near Lake Titicaca, its whole extent from the centre of the province of Bolivia being nearly the length of the Amazon itself. At its mouth it is two miles wide and sixty-six feet deep; and five hundred miles up it is a mile wide. Numerous islands are found in its course: for nearly five hundred miles it is navigable for large vessels, when a cataract intervenes. Were it not for this, there would be a free navigation from the centre of the province of Bolivia to the ocean, embracing islands the size of many of the Old World

provinces, and widening into broad lakes. The monarch of waters flows on between its low forest-clothed banks till, four hundred miles from its mouth, it reaches the Strait of Obydos, where it is narrowed to two thousand paces. Through this channel its waters rush with immense force, calculated at five hundred thousand cubic feet in one second—sufficient to fill all the streams in Europe, and swell them to overflowing. No plummet has hitherto sounded the depth of its bed at this point, the force of the stream probably rendering the operation almost impracticable.

Its last two great tributaries are the Tapajos, six times the length of the Thames, and the Xingu, twice that of the Rhine; while further east a narrow channel unites it with the River Para, into which flows the broad stream of the Tocantins. This river, rising in the Minas-Geraes, six hundred miles from Rio Janeiro, is one thousand six hundred miles long, and ten miles wide at its mouth. Opposite to Para is the large island of Marajo; and if Professor Agassiz is right in supposing that the continent once extended much further to the east than it now does, this island may properly be considered in the centre of the mouth of the river, and the River Para might then properly be called one of its true embouchures. But only a few of the streams which feed the Amazon have been named. Numberless other rivers swell its waters, united to it by countless channels which form a wonderful network throughout the whole region, joining also many of the main rivers together, with the intricate navigation of which the natives alone are acquainted.

These curious water-paths, or igarapes, as they are called, are often so narrow that the branches of the lofty trees meet overhead, enabling the traveller in his canoe to proceed for miles together sheltered from the noonday sun. Here and there a glimpse of the sky can be discovered through the umbrageous foliage overhead, while birds of gay plumage flit to and fro, or sit perched on the branches uttering their strange and varied cries. In the intervals, or sometimes forming the termination of the water-path, numerous pools of various sizes exist—some a few yards across, others expanding into lakes—filled mostly by the overflowing of the main river during the rainy season. They are the habitations of a great variety of fishes. Here several species of turtles and alligators swarm in vast numbers; electric eels, too, abound in them, as well as many of the other curious water-creatures of that region. Water-fowl and various other aquatic birds dwell on their banks, while on the surface of their placid waters float the wide-spreading leaves and magnificent

blossoms of the Victoria Regia, as also of other lilies and water-plants.

Scenes on the Amazon.

The chief feature of the Lower Amazon is the vast expanse of smooth water, of a pale yellowish-olive colour, bearing on its bosom detached masses of aquatic grass floating down like islands, sometimes mixed with huge trees, their branches and roots interlocked, and often carrying among them wild animals, which, unconscious of their character, have there taken refuge from their foes, or have ventured thither in search of prey. The timid stag and fierce jaguar are sometimes thus entrapped and carried out to sea. At even and morn flocks of parrots and large and yellow macaws, fly backwards and forwards, uttering their wild and hoarse cries; herons and rails frequent the marshes on its banks; while all night long the cries of gulls and terns are heard over the sandy banks where they deposit their eggs, while they may be seen during the day sitting in rows on floating logs gliding down the stream, motionless and silent, as if contemplating the scenery. There are divers and darters, too, in abundance. Now and then a huge manatee comes gliding by, its cow-like head rising to breathe the upper air; while dolphins, porpoise-like, rear their backs above the surface, or leap half out of the water as they swim up the stream. On the low banks, huge alligators with open jaws are basking in the sun, or leisurely swimming across the river.

The Rainy Season.

This magnificent region enjoys a perpetual summer, its various fruits coming to maturity, according to their character, at different periods throughout the year. It has, however, its wet and dry seasons. The rain occurs at one time in the Upper Amazon, and at another in the Lower,—greatly swelling the volume of water in the main stream, which, unable to find its way towards the ocean, rushes through the countless channels and igarapes, overflowing the lower portions of a vast district called the Gapo. The waters begin to rise in February, and progress inch by inch until the middle of June, gradually swelling the rivers and lakes, when, these becoming filled, the lower lands and sand-banks are overflowed even far-away in the interior. The forests are traversed by numerous gullies, which in the dry season are wide dells, but now become transformed into broad creeks, through which canoes can proceed to great distances under the shade of the lofty trees.

At this period of the year the inland pools are frequented by swarms of turtle, as well as alligators, and shoals of fish which leave the main river; while the flocks of wading birds migrate northerly, thus greatly dispersing the food on which the natives depend for their existence. The fishermen who have been employed during the dry months in catching turtle and fish on the sand-banks return to their villages, though some employ themselves in collecting the Brazil-nut and wild cacao, which are now ripe.

About the first week in June, the flood has risen sometimes to the height of forty feet above the usual level of the river, when it now begins to subside. The rains, however, do not fall continuously, though very heavy at times. Several days of beautiful sunny weather generally intervene. The fine season begins with a few days of brilliant weather—the rays of the sun breaking forth among the passing clouds. Towards the middle of July the sand-banks again appear, flocks of gulls and other water birds fly by, and the gaily-plumaged inhabitants of the forest come forth into full activity and life.

Storms.

The navigation of the Amazon is not free from danger. Fierce storms arise; black clouds gather over the blue expanse, suffused anon with a lurid yellow tinge, and the fierce whirlwind howls along the river-banks, tearing the placid stream into masses of foam; the tall trees bend before the blast, and huge branches are wrenched off and hurled into the water. The long-legged waders and other water birds, unable to face it, throw themselves on the ground, and cling with claws and beak to the sand to escape being carried helplessly away.

The Pororocca.

Sometimes, too, the destroying pororocca—a vast wave rising across the whole width of the stream, to the height of twelve or fifteen feet—sweeps up the stream. Advancing noiselessly over the deeper portions of the river-bed, it rises into an angry billow, with a fearful roar when passing over a shallow, or meeting any impediment in its course. A French traveller describes an island where he and his companions had rested on their voyage down the stream. They had happily gone over to the mainland on the previous evening, when, as they stood on the shore, the pororocca was heard approaching. Onward it came till the island was reached, when, with an angry roar, it burst into masses of foam, and swept over the devoted spot,

carrying in its fierce embrace not only the whole mass of vegetation, but overturning the foundations of the island itself, so that in a few seconds not a vestige remained. Sometimes, too, the higher banks of the Upper Amazon, crowned by lofty trees, are worn away by the rapid current, increased during the rainy season, continually passing beneath them, till the upper portions, deprived of their support, fall over with a terrific roar into the stream, dragging with them their neighbours. The earth trembles with the concussion, the waters hiss and foam and rush furiously over the impediments in their course. Sometimes miles of the bank thus give way, the sound being heard far up and down the stream. Occasionally a canoe and its crew—who, to avoid the current, have been toiling close along the bank—have been thus overwhelmed; while others, descending, unaware of the obstruction, have been dragged by the furious whirlpool thus formed amid the tangled branches, and destroyed.

Part 3—Chapter IV.

Character of Vegetation on the Banks.

A dense vegetation, though somewhat varied in character, rises like a lofty wall of verdure along the banks of the mighty stream, from the base of the Andes to its mouth in the Atlantic. There, where the influence of the sea-breeze is felt, the ever-present mangrove of the tropics forms a thick belt round the shores of its numberless islands. Higher up, various palms of many graceful forms appear, interspersed with numberless other trees, some bearing huge pods a yard long, others vast nuts and other curious fruits,—the banks below fringed either with giant grasses and broad-leaved bananas, or here and there with the large wide heart-shaped leaves of the aninga growing on the summit of tall stems, or in other places with the murici of a lower growth close to the water's edge. Among the most remarkable is the white-stemmed cecropia, the lofty massaranduba, or cow-tree, often rising to the height of one hundred and fifty feet; the seringa, or india-rubber tree, with its smooth grey bark, tall erect trunk, and thick glossy leaves. The assai-palm, with its slender stem, its graceful head and delicate green plumes, is at first more numerous than any other. Now appears the miriti, or mauritia—one of the most beautiful of its tribe, with pendent clusters of glossy fruit, and enormous spreading fan-like leaves cut into ribbons; the jupati, with plume-like leaves forty feet and upwards in length, graceful in

the extreme, starting almost from the ground. Here is seen also the bussu, with stiff entire leaves, also of great length, growing upright from a short stem, close together, and serrated along their edges. Higher up still, while the palms become less numerous, other trees take their places. Among them appears conspicuous the majestic sumaumera, its flat dome rounded, but not conical, towering high above the forest. The branches of this tree are greatly ramified and knotty, and the bark is white. Conspicuous, too, is the taxi, with brown buds and white flowers; while the margin of the water is thickly fringed by a belt of arrow-grass, or *frexes*—so called by the Portuguese—six feet in height. Its name is given in consequence of being used by the Indians in making arrows for their blowpipes.

Amid this wonderful mass of forest vegetation grows an intricate tracery of lianas and climbing sipos, some running round and round the trees, and holding them in a close embrace; others hanging from branch to branch in rich festoons, covered with starlike flowers, or dropping in long lines to the ground,—often to take root and shoot upwards again round a neighbouring stem, or drooping like the loose cordage of a ship swinging in the breeze. Often they form so dense and impenetrable a thicket from the ground upwards that a way must be cleared with an axe to proceed even a short distance from the banks towards the inner recesses of the forest.

The Gapo.

On the Gapo, or submerged lands, however, a considerable difference in the vegetation appears. The palms are here often more numerous than in other parts. This is the region where the cacao-tree and prickly sarsaparilla grow. Here the underwood is less dense, the sipos retiring to weave their tracery among the upper branches alone. Though during the dry season the vegetation springs up with wonderful rapidity, it is swept away by the next overflow.

Here the lovely orchis tribe adorn the gloomy shades with their brilliant flowers. Among the most beautiful is the oncidium, of a yellow hue, often seen—apparently suspended in air between the stems of two trees—shining in the gloom, as if its petals were of gold. In reality it grows at the end of a wire-like stalk a yard and a half long, springing from a cluster of thick leaves on the bark of a tree; others have white and spotted blossoms, growing sometimes on rotten logs floating on the water, or on moss and decayed bark just above it. Still more magnificent is

the Flor de Santa Ana, of a brilliant purple colour, emitting a most delicious odour.

Peculiar and strange is this region of the Gapo. When the waters are at their height it can be traversed in all directions. The trees which grow on it, and the animals which here have their abodes, appear to differ from those of other districts.

Let us accompany the naturalist Wallace, in his canoe, through a district of this description; now forcing our way under branches and among dense bushes, till we get into a part where the trees are loftier and a deep gloom prevails. Here the lowest branches of the trees are level with the surface of the water, many of them putting forth flowers. As we proceed we sometimes come to a grove of small palms, the leaves being now only a few feet above us. Among them is the maraja, bearing bunches of agreeable fruit, which, as we pass, the Indians cut off with their long knives. Sometimes the rustling of leaves overhead tells us that monkeys are near, and we soon see them peeping down from among the thick foliage, and then bounding rapidly away. Presently we come out into the sunshine, on a lake filled with lilies and beautiful water-plants, little bladder-worts, and the bright blue flowers and curious leaves with swollen stalks of the pontederias. Again we are in the gloom of the forest, among the lofty cylindrical trunks rising like columns out of the deep water; and now there is a splash of fruit falling around us, announcing that birds are feeding overhead, and we discover a flock of parrakeets, or bright blue chatterers, or the lovely pompadour, with its delicate white wings and claret-coloured plumage. Now, with a whirl, a trogon on the wing seizes the fruit, or some clumsy toucan makes the branches shake as he alights above our heads.

This region, as might be supposed, is not destitute of inhabitants. Several tribes of Indians dwell within it all the year round. Among them are the Purupurus and Muras tribes, who, spending most of their time in their canoes, in the dry season build small huts on its sandy shores; and when the waters overflow it, form rafts, which they secure between the trees, sleeping in rude huts suspended from the stems over the deep water, and lighting their fires on masses of mud placed on their floating homes. They subsist entirely on fish, turtle, and manatee.

Several species of trogons are peculiar to this submerged region. The curious black umbrella-bird is entirely confined to it, as is also the little bristle-tailed manakin. Several monkeys visit

it during the wet season, for the sake of its peculiar fruits; and here the scarlet-faced urikari has its home.

For miles and miles together the native traverses this region in his canoe, passing through small streams, lakes, and swamps, scraping the tree trunks, and stooping to pass between the leaves of the prickly palms, now level with the water—though raised on stems forty feet high—while everywhere round him stretches out an illimitable waste of waters, but all covered with the lofty virgin forest. In this trackless maze, by slight indications of broken twigs or scraped bark, he finds his way with unerring certainty.

"This curious region," says Wallace, "extends from a little above Santarem to the confines of Peru, a distance of about 1700 miles; and varies in width on each side of the river from one to ten or twenty miles."

Trip up an Igarape into the Interior.

Let us leave the mighty stream, and wander amidst the picturesque windings of an igarape, into the depths of the forest, with Professor Agassiz. Passing into its narrow entrance, the lofty trees arching overhead shelter the voyager in his light canoe from the glaring heat of the noonday sun. The air is cool and refreshing. Not a ripple stirs the water, save that caused by the paddles of the Indian crew. Clumps of the light and exquisitely graceful assai-palm shoot up everywhere on either side from the denser forest. Here and there the drooping bamboo dips its feathery branches into the water, covered sometimes to their very tips with the purple of convolvuli; yellow bignonias carry their golden clusters to the very summits of some of the more lofty trees; while white-flowering myrtles and orange-coloured mallows border the stream. Life abounds in this quiet retreat. Birds and butterflies are numerous on the margin of the water. Crabs of every variety of colour and size sit on the trunks of decaying logs, watching for their prey,—to make their escape, however, with nimble feet, when pursued.

Or let us start before daylight, on a calm morning, along the banks of a larger tributary, to proceed towards the heights of the Sierra Erere. As dawn begins to redden the sky, large flocks of ducks and of a small Amazonian goose may be seen flying towards the lake. Here and there we see a cormorant, seated alone on the branch of a dead tree; or a kingfisher poises himself over the water, watching for his prey. Numerous gulls are gathered in large companies on the trees along the river-

shore. Alligators lie on its surface, diving with a sudden splash at the approach of the canoe. Occasionally a porpoise emerges from the water, showing himself for a moment, and then disappearing. Sometimes a herd of capybaras, resting on the water's edge, are startled at our approach.

There sits, on the branch of an imbauba, rolled-up in its peculiar attitude, a sloth, the very picture of indolence, with its head sunk between its arms. The banks, covered in many places with the beautiful capim-grass, afford excellent pasturage for cattle.

Now we turn into an inner stream, or igarape, often having to make our way with difficulty amid islands of capim-grass. Now we pass through a magnificent forest of the beautiful fan-palm—the miriti—overshadowing many smaller trees and innumerable shrubs, bearing light conspicuous flowers. Among them are numerous Leguminosae—one of the most striking, the fava, having a colossal pod.

The whole mass of vegetation is interwoven with innumerable creepers, amid which the flowers of the bignonia, with their open trumpet-shaped corollas, are conspicuous. The capim is bright with the blossoms of the mallow growing in its midst, in some places edged with the broad-leaved aninga—a large aquatic arum. Through these forests, where animal life is no less rich and varied than the vegetation, our canoe glides silently for hours.

The sedgy grasses on either side are full of water birds. One of the most common is a small chestnut-brown wading bird—the jacana—whose toes are immensely long in proportion to its size, enabling it to run over the surface of the aquatic vegetation as if it were solid ground. It is their breeding season—January. At every turn of the boat we start them up—usually in pairs. Their flat, open nests generally contain five flesh-coloured eggs, streaked in zig-zag with dark brown lines. Among the other waders are a snow-white heron, another ash-coloured, and a large white stork. The ash-coloured herons are always in pairs—the white always singly, standing quiet and alone on the edge of the water, or half hidden in the green capim. The trees and bushes are full of small warbler-like birds. The most numerous and interesting is one which builds a very extraordinary nest, considering the size of the bird. It is known among the country people by the name of *pedreiro*, or the *forneiro*—both names referring to the nature of its habitation. This singular nest is built of clay, and is as hard as stone—*pedra*; while it is the shape of the mandioca oven—*forno*—in which the country people prepare their farina. It is about a foot in diameter, and

stands edgewise upon the branch or crotch of a tree. Among the smaller birds are bright tanagers, and a species resembling the canary. Humming-birds are scarce, though here and there a few appear; while countless numbers of parrots and parakeets fly overhead in dense crowds, at times drowning every other sound with their noisy clatter.

Birds of prey are not wanting. Among them is the red hawk, about the size of a kite—and so tame, that even when a canoe passes under the branch on which he is sitting, he does not fly away.

Among the most striking are the gallinaceous birds. The commonest is the cigana, to be seen in groups of fifteen or twenty perched on trees overhanging the water, and feeding upon berries. At night they roost in pairs; but in the daytime are always in larger companies. In appearance they have something of the character of both the pheasant and peacock, and yet do not closely resemble either. With the exception of some small partridge-like gallinaceous birds, the representatives of this family in Brazil belong to types which do not exist in any other parts of the world. Here the curassow, the jacu, the jacami, and the unicorn resemble as much the bustard and other ostrich-like birds as the hen and pheasant.

The most numerous insects to be met with are dragonflies; some with crimson bodies, black heads, and burnished wings; others with large, green bodies, crossed by blue bands.

The Campos.

Although the forests cover generally the whole length and breadth of the Amazonian Valley, there are here and there, on the higher ground, open dry plains with scanty vegetation,—the ground in the water-courses or gullies, formed of clay, being baked by the heat of the sun into slate-like masses. One of these spots we now reach. The most prominent plants of this sandy or clayey region are clusters of cacti and curua palms—a kind of stemless, low palm, with broad leaves springing, vase-like, from the ground. Here also grow wild pineapples; and in broad sunlight numerous humming-birds delight to sport and feed upon the blossoms of the various plants which find no room to bloom in the darker shades of the forest.

Geology of the Amazonian Valley.

Professor Agassiz remarks that no formation—known to geologists—resembling that of the Amazon exists on the face of the earth. Its extent is stupendous. It stretches from the Atlantic shore through the whole width of Brazil into Peru, to the very foot of the Andes—one vast extent of red sandstone, capped by a yellow-ochred clay; not only along the banks of the main river, but forming the sides of those of its tributaries, to their far-off sources, probably over the whole basin of the Paraguay and the Rio de la Plata. How are these vast deposits formed? is the question. The easiest answer, he observes, and the one which most readily suggests itself, is that of a submersion of the continent at successive periods—to allow the accumulation of these materials—and its subsequent elevation. This explanation is rejected, for the simple reason that the deposits show no signs whatever of a marine origin. No sea-shells, or remains of any marine animal, have as yet been found throughout their whole extent—over a region several thousands of miles in length, and from five to seven hundred miles in width. It is evident, he considers, that this basin was a fresh-water basin, these deposits fresh-water deposits. It is true that calcareous layers thickly studded with shells have been found interspersed with the clay; but though supposed to be marine fossils, he recognised them for what they really are—fresh-water shells of the family of the Naiades. As their resemblance is very remarkable, the mistake as to their true zoological character is natural: indeed, many travellers have confounded some fresh-water fishes from the Upper Amazon of the genus of *Pterophyllum* with the marine genus *Platax*. He considers that the immense glacier which probably existed at the same time that ice, thousands of feet thick, covered the centre of Europe, must have been formed in this valley, and then, ploughing its bottom over and over again, and grinding all the materials beneath it into a fine powder, must ultimately have forced its way through the colossal sea-wall which it had built up eastward into the Atlantic.

A Day and Night on the Amazon, with their Sights and Sounds.

Day is beginning to dawn, the birds are astir, the cicada have begun their music; flocks of parrots and macaws, and other winged inhabitants of the forest, pass by in numbers, seeking their morning repast; beautiful long-tailed and gilded moths like butterflies fly over the tree-tops. Rapid is the change from the dark night. The sky in the east assumes suddenly the loveliest azure colour, across which streaks of thin white clouds are painted. The varied forms of the numberless trees,

imperceptible during the gloom of night, now appear, the smaller foliage contrasting with the large glossy leaves of the taller trees, or the feathery, fan-shaped fronds of palms. For a time the fresh breeze blows, but flags under the increasing power of the sun, and finally dies away, the heat and electric tension of the atmosphere becoming almost insupportable.

The heat increases as the day draws on. Languor and uneasiness seize on every one;—even the denizens of the forest betray it by their motions. By this time every voice of bird or mammal is hushed. Only in the trees is heard at intervals the whir of the cicada. The leaves, so soft and fresh in the early morn, now become lax and drooping. The flowers shut their petals. The natives, returning to their huts, fall asleep in their hammocks, or, seated on mats in the shade appear too languid even to talk. White clouds now appear in the east, and gather into cumuli, with an increasing blackness along their lower portions. The whole eastern horizon becomes rapidly black, the dark hue spreading upwards. Even the sun is at length obscured. Then the rush of a mighty wind is heard through the forest swaying the tree-tops. A vivid flash of lightning bursts forth, then a crash of thunder, and down streams the deluging rain. The storm soon ceases, leaving the bluish-black motionless clouds in the sky till night. Meantime all nature is refreshed, but heaps of flower petals and leaves are seen under the trees.

Towards evening life revives again. The noises of the forest animals begin just as the sun sinks behind the trees, leaving the sky above of the intensest shade of blue. The briefest possible twilight commences, and the sounds of multifarious life come from every quarter. Troops of howling monkeys, from their lofty habitations among the topmost branches—some near, some at a distance—fill the echoing forest with their dismal noise; flocks of parrots and blue macaws pass overhead, the different kinds of cawing and screaming of the various species making a terrible discord. Added to them are the calls of strange cicada—one large kind perched high on the trees setting up a most piercing chirp. It begins with the usual harsh jarring tone of its tribe, rapidly becoming shriller, until it ends in a long and loud note resembling the steam whistle of a locomotive engine. A few of these wonderful performers make a considerable item in the evening concert. The uproar of beasts, birds, and insects lasts but a short time; the sky quickly loses its intense hue, and the night sets in. Then begin the tree-frogs—Quack, quack! Drum, drum! Hoo, hoo! These, accompanied by melancholy night-jars, keep up their monotonous cries till late at night.

The night, however, is not given over to darkness. In every forest path, across the calm waters of the igarapes, along open spaces, in the village as well as in spots remote from man's abode, the whole air is full of bright and glittering lights of varied hue; now darting here, now there, like meteors flashing through the sky—now for a moment obscured, to burst forth again with greater brilliancy. Beautiful as is the English glow-worm, the fire-flies and fire-beetles, the elaters of the tropics, far surpass them in brilliancy. Their light is redder and more candle-like, and being alternately emitted and concealed, each of the tiny vermilion flames performing its part in the aerial mazy dance, the spectacle is singularly beautiful. In the marshy districts is seen the large elater, which displays both red and green lights; the red glare, like that of a lamp, alternately flashing on the beholder, then concealed as the insect turns his body in flight, but the ruddy reflection on the grass beneath being constantly visible as it leisurely pursues its course. Now and then a green light is displayed, and then the mingling of the two complementary colours, red and green, in the evolutions of flight, surpasses description. Even the brilliant elaters, however, will scarcely enable the traveller to find his way amid the darkness through the forest.

Wallace describes a midnight walk he was compelled to take. He was barefooted, every moment stepping on some projecting root or stone, or treading sideways on something which almost dislocated his ankles. Dull clouds could just be distinguished in the openings amid high-arched, overhanging trees, but the pathway was invisible. Jaguars, he knew, abounded, deadly serpents were plentiful, and at every step he almost expected to feel a cold gliding body under his feet, or deadly fangs in his leg. Gazing through the darkness, he dreaded momentarily to encounter the glaring eyes of the jaguar, or to hear his low growl in the thicket. To turn back or stop were alike useless. Unpleasant recollections of the fangs of a huge dried snake's head he had just before examined, would come across his memory; and many a tale of the fierceness and cunning of the jaguar would not be forgotten. Suddenly he found his feet in water, and then he had to grope for a narrow bridge it was necessary to cross. Of its height above the water, or the depth of the stream, he was utterly ignorant. To walk along a plank four inches wide, under such circumstances, was a nervous matter. He proceeded, however, placing one foot before the other, and balancing steadily his body, till he again felt himself on firm ground. Once or twice he lost his balance, but happily he was only a foot or two from the ground and water below—though, had it been twenty it would have been all the same.

Half-a-dozen such brooks and bridges had to be passed, till at length, emerging from the pitchy shade upon an open space, he saw two twinkling lights, which told him that the village was ahead.

But we were describing a tropical day. Night is over. The sun rising again in the cloudless sky, the cycle is completed—spring, summer, and autumn, as it were, in one tropical day. The days are more or less like this throughout the year. A little difference exists, between the dry and wet seasons. The periodical phenomena of plants and animals do not take place at about the same time in all the species, or in the individuals of any given species, as they do in temperate countries. The dry season here is not excessive, nor is there any estivation, as in some tropical countries. In these forests the aspect is the same or nearly so every day in the year—budding, flowering, fruiting, and leaf-shedding, are always going on in one species or other. The activity of birds and insects proceeds without interruption, each species having its own breeding-times. The colonies of wasps, for instance, do not die off annually, leaving only the queens, as in cold climates, but the succession of generations and colonies goes on incessantly. It is never either spring, summer, or autumn, but each day is a combination of the three. With the day and night always of equal length, the atmospheric disturbances of each day neutralise themselves before each succeeding morning. With the sun in its course proceeding midway across the sky, and the daily temperature the same within two or three degrees throughout the year, how grand in its perfect equilibrium and simplicity is the march of nature under the equator!

“Oppressive, almost fearful, is the silence and gloom of the Brazilian forest,” says Bates. “The few sounds of birds are of that pensive or mysterious character which intensifies the feeling of solitude, rather than imparts a sense of life and cheerfulness. Sometimes, in the midst of the stillness, a sudden yell or scream will startle one. This comes from some defenceless fruit-eating animal, which is pounced upon by a tiger-cat or stealthy boa-constrictor. Morning and evening howling monkeys make a most fearful and harrowing noise, under which it is difficult to keep up one’s buoyancy of spirit. The feeling of inhospitable wildness which the forest is calculated to inspire, is increased tenfold under this fearful uproar. Often, even in the still hours of mid-day, there is a sudden crash, resounding afar through the wilderness, as some great bough or entire tree falls to the ground. Sometimes a sound is heard like the clang of an iron bar against a hard


hollow tree, or a piercing cry rends the air. These are not repeated, and the succeeding silence tends to heighten the unpleasant impression which they make on the mind. The natives believe it is the curupira—the wild man of the forest—who produces all the noises they are unable to explain. He is a mysterious being,—sometimes described as a kind of orang-outang, covered with long shaggy hair, and living in trees; at others, he is said to have cloven feet and a bright red face. He has a wife and children, who, as well as himself, come down to the plantations to steal the mandioca."

Such is a faint outline of some of the more prominent features of the great Amazonian Valley—the most interesting portion of the southern half of the New World. No verbal descriptions can do justice to the reality—although drawn, as some of the above are, by master hands. We will next range along the mighty Cordilleras to the ancient kingdom of the Incas, looking down on the Pacific shores; and then, again descending from the mountain heights, take a brief glance at the debased human beings who people the valley, and pass in review the more interesting of the countless wild creatures which inhabit its forests and waters. Afterwards we will traverse Venezuela, Guiana, the rest of the Brazils, and the wide-spreading level regions to the south of that vast country, the river-bound province of Paraguay, the territories of the Argentine Republic, the wild district of the Gran Chaco, the far-famed Pampas, and the plains of Patagonia.

Part 3—Chapter V.

The Cordilleras.

The voyager sailing from the Atlantic into the Pacific Ocean passes a dark granite headland rising nearly three thousand feet out of the water, and which may be distinctly seen at a distance of sixty miles. It is Cape Horn—the southern end, broken off by the Strait of Magellan, of that range of mighty mountains which runs in a northerly course along the western coast of South America, rising into lofty pinnacles—the summits of many covered with perpetual snow—sinking at length only at the northern extremity, where the narrow Isthmus of Panama unites the two continents. Again it gradually rises in Mexico, and runs on under the name of the Rocky Mountains, at a less elevation and a greater distance from the sea, till it sinks once more into the snow-covered plains of the Arctic region. We

must, however, confine ourselves to the South American portion of the range. For the entire distance its summits are distinctly seen from the ocean, many at a distance of upwards of a hundred miles. Between their base and the shores of the Pacific there is, however, a level tract, in some parts consisting of arid plains, from fifteen to fifty miles in width. In crossing them the traveller finds not a drop of water to quench his raging thirst, nor a blade of grass to feed his weary steed. Among the rocky caverns of those mountain heights the savage bear has its abode, the mighty condor takes its flight from their rugged peaks into the blue ether, and the cold-looking llama, the vicuña, and alpaca find ample pasturage. In the lower, the fierce jaguar ranges amidst its forests of graceful palm-trees, the terrible alligator dwells on the banks of its streams, and the anaconda watches for its prey; while bananas, yams, mandioc, and all the fruits of a tropical clime, attain perfection. This mighty range, however, does not run its length in one distinct line, but separates; in some parts with deep valleys between them, like that of the Puncu of Avisca, while at others there are vast  table-lands; again, however, to unite and spread out into numerous rugged sierras.

The western portion of these ranges is properly the Cordilleras; while the eastern, which slopes towards the wide-extending plains of Brazil, forms the true Andes. The southern portion skirts the bleak shores of Patagonia in a single sierra, for a distance of nearly one thousand miles, in some parts rising to the height of seven thousand feet above the ocean. Entering Chili, the mountains rise higher and higher, till they culminate in the mighty peak of Aconcagua, the most lofty height of the whole range.


At the boundary-line of Bolivia the chain separates into two portions, enclosing the great table-land of Desaguadero, thirteen thousand feet above the sea. At one end of this lofty region is the city of Potosi, rising above the clouds—the highest in the world, erected amid the groans and tears of the hapless natives compelled to labour at its far-famed silver-mines. At the other is found Cuzco, the ancient capital of the Incas. Between them lies the Lake of Titicaca, the centre of bygone Peruvian civilisation.

Running still parallel with the coast, and looking down upon the modern city of Lima, the range passes through Peru till it again divides in three portions at the confines of the equator, where it once more forms two lines, which rise in that magnificent congregation of mountains which surround the famous Valley of

Quito. Here no less than twenty-one volcanoes rear their lofty summits, many of them crowned with perpetual snow, amid which Chimborazo and Cotopaxi are pre-eminent.

To the north of the equator, the Cordilleras again form one vast ridge, and passing through New Granada, spread out like the branches of a palm through Venezuela and along the northern shores of the continent washed by the Caribbean Sea.

The whole of this vast range, from Cape Horn to Panama, gives evidence of the hidden fires which glow beneath its base, and by which it was originally created. Fifty-one volcanoes are found along the line. Of the twenty which surround the Valley of Quito, three are active, five dormant, and twelve are supposed to be extinct. By far the larger number rise out of the eastern range; indeed, the western contains only one active volcano, but out of it tower the peerless Chimborazo, and Pichincha with its deep crater. The whole region is subject to terrific earthquakes, which have from time to time shaken down its cities, caused huge waves to flow over the level land, and destroyed countless thousands of its inhabitants. Chimborazo was long supposed to be the most lofty mountain on the globe. It is 21,420 feet high; but Aconcagua in Chili rises to the height of 23,200 feet. Several of the summits of the Himalayan range in Asia are over 25,000 feet; and Kilima Njaro, the most lofty peak in Africa, is about the same altitude as Chimborazo. Chimborazo, for

solitary grandeur—and from the excessive steepness of its  sides, which has prevented the foot of man from reaching its summit—stands, however, unrivalled.

From the lofty heights over which we have thus rapidly passed, numberless streams take their rise, rushing and foaming down their steep sides to feed those mighty rivers which, flowing across the continent, seek an outlet in the far-distant Atlantic. On the western side, comparatively few and insignificant rivers cross the narrow plains into the Pacific. Thus the inhabitants of the tropical portions have to depend on artificial irrigation for the cultivation of the land.

What mighty force must have been required to raise those mountains to their present elevation,—and how fearful must be the fires which still rage beneath their bases! Gigantic, however, as they seem to human eyes, the most lofty could be represented on a globe six feet in diameter by a grain of sand, less than one-twentieth of an inch in thickness. How insignificant then must the proudest works of man appear—

what a mere speck himself—to One who looks down from on high on this earth of ours!

On examining their sides in various parts, proof is afforded that these vast mountains have been heaved upwards from beneath the ocean. Shells are found 1300 feet above the sea, covered with marine mud. On a beach elevated 2500 feet above the Pacific, numerous species of patella and other shells can be picked up, identical with those obtained on the coast with the living animal inhabiting them. At Huanuco, in Peru, there is a coal-bed existing at the height of 14,700 feet. Shells have also been found at the height of 13,000 feet; and on the side of Chimborazo there is a salt spring 13,000 feet above the ocean.

The surface of the great lake of Titicaca—the largest piece of fresh-water in South America—is 12,795 feet above the Pacific; an elevation greater than that of the highest peaks of the Pyrenees. In the neighbourhood of this lake, remains exist which speak of the advanced state of civilisation of the inhabitants before the appearance of the Incas, with whose latter history alone we are acquainted. So completely is the lake surrounded by mountains, that, though fed by numerous streams, not the smallest rivulet escapes to find its way either into the Pacific or Atlantic. One large river, however, the Desaguadero, flows out of its south-west corner, and disappears in the swampy Lake Aullagas in the south of Bolivia. Its superabundant water must, therefore, be taken off by evaporation, excessive in that elevated region. High above it, amid chilling mists and biting storms of driving snow, are found the silver-mines of Potosi and Pasco.

However, before we wander further amid the giddy precipices and snow-capped summits of this mighty range of mountains, we will descend for a time to the lower world, and glance round its southern extremity and along its western shores, bathed by the waters of the wide-stretching Pacific.

Part 3—Chapter VI.

Southern and Western Shores of the Continent.

Tierra Del Fuego appears as if a mountain region had been partly submerged in the ocean, so that deep inlets and bays occupy the place where valleys would have existed had its base still been above the sea. The greater portion of the

mountainsides are covered, from the water's edge upwards to the elevation of 1500 feet, by one wide-extending forest of evergreen beeches. Scarcely a level spot is to be found throughout the whole country; and so dense is the wood, and encumbered by the trunks of fallen trees and waterfalls, that it is scarcely possible to penetrate it. Here and there on the western side, and in the Strait of Magellan, the forest disappears, and magnificent glaciers extend down to the very water's edge. The mountains on the north side rise to the height of 4000 feet, with one peak above 6000 feet high, covered with a mantle of perpetual snow; while numerous cascades pour their waters through the woods into the narrow channel below. It is scarcely possible to imagine anything more beautiful than the beryl-like blue of these glaciers, especially contrasted with the dead white of the upper expanse of snow.

The inhabitants of this region are among the lowest in the scale of human beings, living in wretched hovels, composed often merely of boughs and leaves, their only clothing scanty pieces of skin, worn on one side, to defend themselves from the icy winds.

These evergreen forests, consisting of only two or three species of trees, with several Alpine plants growing on the heights above them, continue round the coast for six hundred miles or more northward of Cape Horn, till, in the more northern and warmer latitudes, they give place to semi-tropical vegetation. Now stately trees of various kinds appear, with smooth and highly-coloured bark, loaded with parasitical plants; while large and elegant ferns, and numerous and arborescent grasses, entwine the trees into one entangled mass. Palm-trees appear in latitude 37 degrees; and an arborescent grass, very like the bamboo, three degrees further north.

In many places the ocean washes the base of the Andes, or huge spurs project from the mountains; and in others a narrow belt alone is left between them and the water. The whole of Chili, indeed, consists of a narrow strip of land between the Cordilleras and the Pacific; while this strip is often traversed by several mountain lines, which in some parts run parallel to the great range. Extending to the south, between these outer lines and the main Cordilleras, we find a succession of level basins, generally blending into each other by narrow passages.

In the neighbourhood of Valparaiso, above which Aconcagua (23,000 feet in height) looks down on the Pampas on one side and the blue Pacific on the other, is the beautiful valley of Guillota, thoroughly irrigated and brought under cultivation. It

has, during the whole summer, the hot sun striking down from a cloudless sky. It is only in these parts where the nature of the streams affords means of irrigation that vegetation can exist.

Further north, the western shore is in many parts very arid; and about latitude 20 degrees south the burning desert commences, extending 540 leagues—almost to the Gulf of Guayaquil—and varying in width from three to twenty leagues. Over this region of death, heaps of stone or mounds of sand are alone seen, except where, at wide intervals, some mountain stream, fed by the melting snows of the lofty peaks, finds its way into the ocean. It is only in the neighbourhood of these rivers that man can venture to take up his abode. On the banks of most of them have been built the few cities which exist near the sea in Peru. For some miles the traveller finds not a drop of water, no trace of vegetation. His weary horse sinks, overcome with the pangs of thirst and the fatigue of dragging its limbs through the soft sand. Through this region the mule can alone be trusted, as, like the camel of the Eastern desert, it will longer endure fatigue and want of water. Here, as in the deserts of Africa, violent winds stir up the sand, forming vast columns, as terrible in their effects as the flames of the prairie. Rising to a hundred feet in height, they are seen approaching, whirling through the air, till the unhappy traveller finds himself surrounded by an overwhelming mass, and, unable to breathe, sinks exhausted on the ground. Flight alone can save him. Many have here perished. On several occasions, troops attempting to cross the desert have been overwhelmed. Others have lost their way when traversing the sandy plains, and have wandered about, in vain seeking for water to quench their burning thirst. On one side is the salt ocean, on the other the rocky precipices of the mountains. Wandering on for hours and hours, at length, exhausted, they have abandoned themselves to despair. These sand-storms occur more especially during the heats of summer, so completely altering the appearance of the country, by covering it with large hillocks, that the most experienced guides find it at times impossible to discover their way; and perhaps, when searching for it, another storm arises, and once more spreads the mounds over the level plain.

In some places the whole soil is covered with a thick crust of salt, white and hard, giving the country the appearance of being covered with snow. For months and months together, in many parts not a drop of rain falls. At length a shower descends, and, as if by magic, the grass springs up in spots where not a blade was before visible; and for a short time the whole country puts

on a green mantle, soon, however, to be withered up by the burning heat.

Northward of this desert region, the land on the shores of the Gulf of Guayaquil and its neighbourhood is covered with the richest vegetation, supported by the numerous streams which descend from the Andes of Quito and Columbia.

Part 3—Chapter VII.

The Indians of the Cordilleras.

Leaving the burning sand-coast, we will ascend once more the steep sides of the Cordilleras to those fertile tracts found at an elevation of many thousand feet above the ocean; but, before describing the brute creation and the vegetable products of this interesting region, we should properly take a glance at the human beings inhabiting it.

When, in 1524, the Spaniards first reached the western coast of South America, of which they were soon to become the conquerors, they found a people greatly advanced in civilisation. They consisted of two distinct races; the one, known as the Incas, showing a decided superiority in intellectual power over the other. Whence they came is unknown; but a tradition existed, that two persons—husband and wife—had appeared some four hundred years before that period in the neighbourhood of Lake Titicaca, announcing themselves as the Children of the Sun. The husband, Manco Capac, taught the men the arts of agriculture; and his wife, Mama Oello (*mama*, meaning mother), initiating her own sex in the mysteries of weaving and spinning. The wise policy which regulated the conduct of the first Incas (kings, or lords), was followed by their successors, and under their mild sceptre a community gradually extended itself along the surface of the broad table-land, which asserted its superiority over the surrounding tribes.

Fine cities sprang up in different parts of their kingdom, connected by well-formed roads, suited to the nature of the country. Their capital was Cuzco, at some distance to the north of the lake, in latitude 14 degrees south; while the city next in importance to it was Quito, in a rich valley, beneath the equator. These cities were connected by two roads; one passing over the grand plateau, and the other along lowlands at the borders of the ocean. The first was conducted over mountain-

ridges, frequently buried in snow; galleries were cut through the living rock; rivers crossed by suspension-bridges; precipices scaled by stairways; and deep ravines were filled up with solid masonry.

This road was upwards of fifteen hundred miles long; and stone pillars, to serve the purpose of mile-stones, were erected at intervals of about a league along the route. Its breadth was about twenty feet. In some places it was covered with heavy flagstones; and in others, with a bituminous cement, which time has rendered harder than the stone itself. Where the ravines had been filled with solid masonry, the mountain torrents have eaten a way beneath it, leaving the superincumbent mass still spanning the valley like an arch. The suspension-bridges—instead of which wretchedly inferior ones of wood are now used—were composed of the tough fibres of the maguey; a species of osier, possessing an extraordinary degree of tenacity and strength. The fibres were woven into cables of the thickness of a man's body, which were then stretched across the water, and conducted through rings or holes cut in immense buttresses of stone raised on the opposite banks of the river, and there secured to heavy pieces of timber. Several of these enormous cables bound together, side by side, formed a bridge—which, covered with planks well secured, and defended on each side by a railing of the same material, afforded a safe passage for the traveller. The length of this aerial bridge, sometimes exceeding 200 feet, caused it—confined as it was only at the extremities—to dip, with an alarming inclination towards the centre; while the motion given it by the passenger created an oscillation frightful to one whose eye glanced down into the dark abyss of waters, that foamed and tumbled many a fathom beneath.

Over these roads a system of communication throughout the country was kept up by running postmen, called chasquis. Along the roads small buildings were erected, within five miles of each other, at which a number of chasquis were stationed. They were trained to the employment, and selected for their speed and fidelity. As the distance each had to perform was small, he ran over the ground with great swiftness, and messages were carried along all the routes at the rate of a hundred and fifty miles a day. The chasquis not only carried despatches, but brought fish from the distant ocean, and fruits, game, and other commodities, from the warm regions on the coast.

It is not our province to describe the gorgeous temples, palaces, and convents, in which the Virgins of the Sun resided, and the numerous other public buildings, extensive remains of which

still exist scattered throughout the region. The glory of the Incas has departed. But few of their descendants remain, and their blood has generally mingled with that of their conquerors.

The Native Indians.

The tribes over whom they ruled are still to be found, though in diminished numbers, and debased by the cruel system of oppression under which they long groaned. The native inhabitants of the central region of the Andes are known as the Quichuas, and their chief characteristics are common to the greater number of the tribes along the whole extent of the range. Though the languages of the different tribes vary, they are probably derived from the same source. The head of the Quichua is an oblong longitudinal, somewhat compressed at the sides. He has a low and very slightly arched forehead; a prominent, long, aquiline nose, with large nostrils. The mouth is large, and the teeth very fine, while the lips are not thick; the chin is short, but not receding; cheek-bones not prominent, eyes horizontal and never large, eyebrows long, the hair jet-black—and, though thick, straight and coarse, yet soft. He has little or no beard. In stature they seldom reach five feet. The chest is long, broad, deep, and highly arched. The hands and feet are small. The colour is between olive, brown, and bronze,—somewhat like that of the mulatto. Though their chests are broad, and their shoulders square, their arms are weak—their chief strength existing in their backs and legs. Mild, generous, and submissive, they have existed when a fiercer race would have been exterminated; but, on several occasions, they have shown that they can be goaded into revolt. About the year 1770, under Tupac Amaru, they broke into rebellion, when, had they possessed better arms and more discipline, they might, with the courage they exhibited, have driven the Spaniards from the country. The rebellion was put down with the atrocious cruelties to which the Spaniards have invariably subjected this unhappy race.

On the eastern slopes of the Andes are found savage tribes, wearing few or no clothes, painting their skins, and ornamenting themselves with the coloured feathers of birds. Towards the southern end of Chili, the fierce Araucanians inhabit the mountains. Beyond them are the large-limbed Patagonians, clothed in skins; and at the extreme end, the wretched Fuegians, living in nearly a state of nature, on seals and fish.

The race supposed to have been the most civilised before the time of the Incas were the Aymaras, whose descendants still inhabit the shores of Lake Titicaca. Their language differs from the Quichua, though evidently a sister-tongue.

This expanse of water, already mentioned, is about eighty miles long and forty broad. Numerous rivers flow into it; in some places it is very deep, but in others so shallow that there is only just room to force the balsas through the rushes. It abounds in fish of peculiar form, and in aquatic birds. Several islands rise above its surface. That of Titicaca, from which it takes its name, is most celebrated.

During one of the several occasions when the Indians rose against their taskmasters to free themselves from the mita—a system which compelled one-seventh part of the male population to labour in the mines—the lake, for a long time, afforded them a place of refuge. In some places along the shores, beds of rushes exist nine leagues long and one broad. In the midst of them there is an island, to which lanes were cut through the tangled mass. This watery labyrinth was navigated by the Indians in their balsas; and, secure in their retreat, they contrived to make inroads on the Spanish towns in the neighbourhood for a length of time. (These balsas are composed of reeds, tightly fastened together on the sides, in the form of boats, and are propelled both by sails and paddles.) Several of the Indian chiefs were at length captured and executed. This, however, only exasperated the rebels, who, under an enterprising leader, attacked the bridge over the Desaguadero, and carried off the heads of their chiefs, which had been stuck on poles above it. The Spanish troops sent against them waded to some islets, but the Indians, hovering round them in their balsas, prevented them from advancing further. At length the Spaniards embarked in twenty balsas, and came in sight of the native squadron. The Indians, however, going in and out among the lanes and rushes, baffled their oppressors, cutting off several Spanish balsas. A party of cavalry also, advancing into the swampy ground, was suddenly surrounded and cut to pieces, with a loss to the Indians of only three men.

These outbreaks, and the far more important rebellion under Tupac Amaru, show that Spanish tyranny had not entirely succeeded in crushing the spirit of the Indians. During the civil wars which for so long devastated the Spanish provinces of South America, the Indians fought with a courage fully equal to that of the whites.

The Puna.

An elevated region called by the Quichuas the Puna, or “the uninhabited,” must be described. A scanty vegetation covers these vast plains. Man can with difficulty breathe on them, or produce the means of existence. Barley, though cultivated, seldom ripens; the chief plant which grows to maturity being the *maca*, which has tuberous roots, and is used like the potato. In consequence of the diminished pressure of the air, water begins to boil at so low a temperature that neither meat, potatoes, nor eggs, can be sufficiently cooked. From the same cause, those unaccustomed to the rarefied air are afflicted with an attack called the *vela*—consisting of headache, nausea, and producing even spitting of blood, and other disorders of the mucous membrane. Horses suffer in the same way; and cats are so affected that they die in violent convulsions. There is another complaint, called the *chanu*, affecting the skin of the hands and face, as well as the eyelids; when, the skin breaking, blood flows from every opening. The *surumpe*, by which travellers are affected—the inflammation of the eyes caused by the reflection from the snow—is still more painful. Often the agony which even an Indian suffers from it is so great, that he has been known to sit down and utter cries of anguish; while, occasionally, total blindness has been the ultimate consequence.

But it is time that we should turn to the brute creation existing in these regions, noticing the interesting specimens of the vegetable kingdom as we proceed in our survey. As the camel is the characteristic animal of the sandy deserts of Arabia and Africa, the royal tiger of the jungles of Bengal, and the kangaroo of the wide-extending plains of Australia, so the llama brings to our recollection the lofty plateaus of the Andes, and the mighty condor its still higher peaks.

Part 3—Chapter VIII.

The Wild Animals of the Cordilleras.

The Llama.

It is on the above-mentioned bleak table-land that the llama, with its kindred—the alpaca, vicuña, and huanucu—are found. The historian of the conquest calls them the sheep of Peru, but the llama is more allied in its characteristics to the camel of the

desert. In outward form, except that it has no hump on its back; in the structure and cellular apparatus of the stomach, which enable it to abstain for a long time from water; in the expression of its large full eye; in the mobility and division of the upper lip; in its fissured nostrils; in the nature of its teeth; and in its long woolly clothing and slender neck,—the llama has a strong resemblance to the camel of the deserts of Arabia. While the camel's feet, however, are formed for passing over the burning sands or level ground, and are therefore broad and cushioned, those of the llama, to enable it to climb the rugged crags of the Cordilleras, are slender, elastic, and claw-tipped. The llama has indeed been rightly called the camel of the mountains, and was employed by the ancient Peruvians—as it is at present—as a beast of burden. The load laid upon its back rests securely upon a bed of wool, without the aid of girth or saddle. It cannot carry more than from eighty to one hundred pounds. If overladen it will lie down, and nothing will induce it to rise till it has been relieved of its burden.

The llamas move in troops of five hundred or even one thousand, and thus, though each individual carries but a little, the aggregate is considerable. The whole caravan travels at a regular pace—passing the night in the open air without suffering from the cold—marching in perfect order, and in obedience to the conductor. Thus they proceed over rugged passes from twelve to fifteen miles a day. They were especially employed in bearing the produce of the mines of Potosi to the coast, often in places where the hoof of the mule could find no support. It was estimated, after the conquest, that 300,000 were thus employed. As they never feed after sunset, it is necessary, when journeying, to allow them to graze for several hours during the day. They utter a peculiar low sound, which at a distance resembles, when the herd is large, the tone of numerous Aeolian harps. On seeing any strange object which excites their fears, they immediately scatter in every direction, and are with difficulty reunited. The Indians treat them kindly, ornamenting their ears with ribbons, and hanging little bells about their necks. When any of them, over-fatigued, fall to the ground, their conductors endeavour by every gentle means to induce them to proceed. In spite, however, of the kind treatment they receive, numbers, from the heat of the coast region, which they cannot stand, annually perish.

When offended, the llama shows its anger by turning its head at its driver, and discharging a saliva with a bad odour in his face. It is about the size of the stag. It carries its long neck upright, constantly moving its long ears. The animals vary in colour.

Some are of a light brown, the under part being whitish; others dappled; but they are seldom found quite white or black. In consequence of the introduction of the mule and horse into the country, which have superseded them in many places as beasts of burden, their price seldom exceeds three or four dollars. The flesh of the llama is eaten; and as many as 4,000,000 were, in days gone by, annually killed for food.

The Alpaca.

The alpaca is smaller than the llama, and somewhat resembles the sheep. It has a long, soft, fine fleece of a silky lustre. In the domestic breeds the wool falls in large flakes reaching down to the knees. This wool was employed by the ancient Peruvians for weaving a kind of cloth. It approximates in character to silk, and a large quantity is now exported to Europe for the manufacture of shawls and other delicate fabrics. Immense herds of the llama or alpaca were held by the Peruvian government, and placed under the protection of herdsmen, who conducted them from one quarter of the country to another, according to the season. They were exclusively the property of the Incas; as were the vicuñas, which roam in native freedom over the frozen ranges of the Cordilleras.

The Huanucu.

The huanucu is considerably larger than the llama, which it so much resembles, that it was formerly considered to be the same animal in a wild state. The body is brown, with the under parts white; the face is of a blackish-grey, approaching to white about the lips. The fleece is shorter and not so fine as that of the llama. The huanucus are very shy, and only when caught young can they be tamed—and even then they can rarely be induced to carry burdens. They generally live in small troops of from five to seven. Not unfrequently they may be seen scaling the snow-covered peaks to a height which no other living thing save the condor can reach. They find sustenance in the *ychu*, a species of grass which grows all along the great ridge of the Cordilleras, from the equator to the southern limits of Patagonia.

The Vicuña.

The vicuñas are very beautiful and graceful creatures, with the habits of antelopes. They have long, slender necks, and rich fawn-coloured coats, with patches of white across the shoulders and inside the legs. The wool is shorter and more curly than

that of the three other species, and, from its extreme fineness, is of much greater value.

During the dry season, when the grass of the plains has withered, they descend to the swampy ground below. One male is followed by a dozen or more females, over whom he watches with the most faithful care. Should he apprehend danger, he utters a loud, shrill cry of alarm, and rapidly advances. The herd then collecting, moves forward slowly; but immediately they discover the approach of an enemy they wheel round and fly—at first at a slow pace, frequently looking round, and then away they dart, fleet as the wind, the male covering their retreat. Should their protector be wounded, the females return and keep circling round him, uttering piercing notes of sorrow, and remain to be shot rather than desert their companion.

Although it is only when enraged that the llamas and huanucus spit upon those near them, the vicuñas and alpacas invariably eject saliva and undigested food—which has a peculiarly disagreeable smell—upon all who approach them.

Vicuñas in vast numbers are found ranging over the more remote and lofty regions of the Puna, where they are able to find a safe retreat from the attacks of man. They have, however, a very formidable enemy in the ravenous condor, who frequently robs them of their young.

These two wild species the Peruvian peasants were never allowed to hunt, they being as much the property of the government as if enclosed within a park. Only on stated occasions, once a year, great hunts took place under the superintendence of the Inca, or his principal officers. They were never repeated in the same quarter oftener than once in four years, that time might be allowed for the waste occasioned by them to be replenished. At the time appointed the whole surrounding population—sometimes, it is said, amounting to nearly ten thousand men—formed a circle round the area which was to be hunted over. Armed with spears, they gradually closed in, destroying the beasts of prey, and driving the huanucus, vicuñas, and deer towards the centre, where the male deer and the huanucus were slaughtered. Their skins were reserved for various useful manufactures; and their flesh, cut into thin slices, was distributed among the people, who converted it into chasqui, or dried meat (constituting then, as it does now, the principal animal food of the lower classes of Peru).

The vicuñas are hunted at the present day. A member from each family of the Puna villages joins the hunting party, forming altogether a band of about one hundred persons. They carry poles with cordage. The poles are placed in the ground, and united by ropes at about the height of two feet, forming a circle of half a league in circumference, enclosing a space called the *chasqu*. Coloured pieces of rag are attached to the ropes, which are moved about by the wind. Some of the hunters are on horseback, others on foot. Each man is armed with the well-known bolas; which consists of three balls of lead, two of which are heavy and one lighter, attached to a long leathern thong knotted together at one extremity. The hunter takes the lighter ball in his hand, and swings the other two in a wide circle over his head. When at a distance of fifteen or twenty paces from the animal, the lighter is let loose, when the three fly in circles towards it, encompassing it in their snake-like folds. Thus prepared, the hunters disperse, forming a circle several miles in circumference, driving all the vicuñas before them towards the entrance of the circle. As soon as the animals have entered, it is closed. The vicuñas, afraid to spring over the ropes with the coloured rags fluttering in their faces, are attacked by the hunters with their bolas, the hind-legs being generally aimed at. The huanucus, which are much wilder, invariably leap the barriers and escape, when frequently the vicuñas follow their example. As soon as the animals within the *chasqu* are killed, it is carried off and again erected at a distance of twelve or more miles, when the same operation is gone through. Thus from one hundred to three hundred animals are killed during the chase, which generally lasts for a week.

Notwithstanding the opposition from the Peruvian government, a large herd of alpacas were, some years ago, successfully carried to the coast and shipped off to Australia, where, in a high and dry district, they appear to be flourishing.

The Condor.

The traveller standing on the rocky heights of the Cordilleras, at an elevation which Etna does not surpass, though still with many a snow-capped mountain round him, may see, on one of the dizzy pinnacles amid which he stands, a vast bird. It is the condor, the largest of the vulture tribe; the monarch of the birds of that region. He may know it by the glossy black colour, tinged with grey, of its body; the greater wing-coverts, except at the base and tips, and the quill-feathers being mostly white. Round the neck is a white ruff of down; the skin of the head and neck is excessively wrinkled, and is of a dull reddish colour with

a tinge of purple. Surmounting the forehead is a large, firm comb, with a loose skin under the bill which can be dilated at pleasure. Now it expands its wings, nine feet from tip to tip. Off it flies from its rocky perch, now appearing to sink with its own weight; but, gradually rising, it soars aloft, even above the glittering dome of Chimborazo, no vibration seen in its powerful wings. Higher and higher it soars, till it appears a mere speck in the blue ether; then, lost to the sight of human eye, darts rapidly downwards towards the sultry coast of the Pacific, there to prey upon the putrefying carcasses of animals it may espy from afar.

On that lofty pinnacle, or some jutting ledge near it, the female has laid its two eggs, and here it rears its young. The eggs are large and white, and laid upon the bare rock. The young are covered with a whitish down, and, it is said, are unable to fly for an entire year. Few other birds can fly to so great a distance above the earth. It appears to respire as easily in the most rarefied air as on the seashore. They do not live in pairs, like the eagle, but several are generally found together. When an animal falls dead, a number of the vast birds are soon seen coming from afar to feast on the carcass.

Great as is the altitude to which the condor can fly, and although it ranges through clouds and storms to the southern end of the Andes, it is not found to the north of Panama.

The condor is a true vulture, gorging itself on dead and putrid carcasses. It will also attack the young llama, as well as lambs and calves, which it carries away in its powerful talons. This makes it dreaded and hated by the shepherds of the hills and plains alike, who seek its destruction by a variety of means. Firearms are, however, useless, as its thick and strongly-constructed coat of feathers will turn aside a bullet. Besides, it is so tenacious of life, that one has been known to receive several bullets in its body, and to have lived a considerable time afterwards. The shepherds train their dogs to give notice of the approach of a condor; and the moment one appears in the sky, they look upwards, and bark violently till their masters appear. Among other modes which the natives employ to capture it, they kill an old mare—which they have an idea is better than a horse—and allow the bird to gorge itself. It then becomes so sluggish, that they can without difficulty throw their bolas round its neck and legs. It also sleeps so soundly, that they frequently manage to approach it when at roost, and capture it in the same way.

In the province of Abacay, in Peru, another method is employed. A native fastens a quantity of putrid flesh to a fresh cow-skin, under which he lies hid with a supply of rope. When the condor pounces down upon the meat, and remains gorging himself, the native fastens its legs by means of the rope to the skin. As soon as this is done, he creeps from beneath it. The frightened bird in vain attempts to escape. Immediately the hunter's companions, rushing forward, throw their bolas over the bird, and make it captive. Frequently several are thus caught at the same time.

The cruel and disgusting custom of bull-baiting is still kept up in the country, and the condors are employed to add to the terror and sufferings of the unhappy bull. Before the unfortunate animal is driven into the circus, his back is laid bare with a lance, and one of the birds, which has been starved for a week or more, is bound upon it. The famished condor immediately attacks the raw, quivering flesh of the poor beast; and while it is thus engaged, the bull is driven into the midst of the arena, to afford amusement to the savage spectators.

There is among the mountains a natural funnel-shaped excavation, sixty feet in depth, and about eighty feet in diameter at the top. The Indians place, on the edge of the pit, the putrid body of a mule, so balanced that it will easily fall over. In a short time it is discovered by numbers of condors, which, darting down, greedily attack it. Tugging and pulling at the flesh, they soon draw it over the edge, when it falls to the bottom of the pit. Not to be disappointed of their prey, they hold tightly to the body, and descend with it. Here, having gorged themselves, they are unable to rise again to the mouth of the pit, and are speedily killed with stones and sticks by the natives who collect round it, or are drawn captive to the surface. Dr Tschudi, in his Travels, mentions having seen twenty-eight birds at one time thus destroyed.

They are caught in a similar manner in other places, and brought down to the coast, where they are sold for a few dollars; and often thus find their way to Europe. It was long an unsettled point whether the condor discovers the dead animals on which it feeds by the power of sight or of scent; but Darwin, by several experiments, has settled the question in favour of the bird's keenness of vision.

A number of condors were kept captive in a garden, secured by ropes. Wrapping up a piece of meat in white paper, and holding it in his hand, he walked up and down in front of the birds; but they took no notice of it. He then threw it down in front of an

old male bird; but it was still disregarded. He then pushed it with a stick till it touched the condor's beak, when the paper was torn off with fury, and every bird in the row began struggling and flapping its wings to reach the food. Under the same circumstances, no dog would have been deceived.

The condor is said formerly to have been worshipped in Peru. Perhaps the Peruvians, seeing it descend through the air from beyond their sight, supposed it a celestial messenger from the sun, which they worshipped. If so, their descendants treat it in a very different way to what they must then have done.

A condor ordinarily measures nine feet from tip to tip of the wings, and slightly over four feet from beak to tail.

Part 3—Chapter IX.

The Vegetable Productions of the Cordilleras.

Chinchona or Peruvian Bark.

The chinchona (it is erroneously spelt cinchona) tree constitutes the type of a natural order (Chinchonaceae), which also includes ipecacuanhas and coffees.

On the western slopes of Chimborazo, and in several other regions extending from the wooded heights of Merida and Santa Martha, at the northern end of the Cordilleras, as far as the Republic of Bolivia, 19 degrees south, the chinchona-tree has its range. Vegetation in the Cordilleras within the tropics reaches to a much greater height than in higher latitudes. The sun's rays have there great power in heating the soil; while the mists drawn from the broad Pacific, rising above the plains, rest upon the lofty sides of the mountains. The warm and humid atmosphere thus created is especially favourable to the growth of certain trees and shrubs. Among others is the chinchona-tree, from which quinine is obtained. It is generally found growing at a height of from 6000 feet to 10,000 feet above the ocean.

It would have been strange had not the native Peruvians been acquainted with the qualities of the bark. The Quichua name for the tree, *quina-quina*—"bark of barks"—shows that they believed it to possess medicinal properties; indeed, there is little doubt that they were aware of its febrifugal qualities, though

they might not have attached much importance to them. Through them, probably, the Spanish colonists in the neighbourhood of Loxa first discovered its virtues. It was, however, but little known till the year 1638, when the wife of the Count of Chinchon, Viceroy of Peru, lay sick of an intermittent fever in the palace of Lima. The corregidor of Loxa, who had himself been cured of an ague by the bark, hearing of her sickness, sent a parcel of powdered quinquina bark to her physician. It was administered to the Countess Anna, and effected a complete cure. She, in consequence, did her utmost to make it known. Her famous cure induced Linnaeus long afterwards to name the whole genus of quinine-yielding trees *Chinchona*, in her honour. The Jesuit missionaries, who had learned its virtues, also sent parcels of the bark to Rome, whence it was distributed to members of their fraternity throughout Europe by the Cardinal de Lugo. Hence it was sometimes called Jesuits' bark, and sometimes Cardinal's bark. For many years, however, great opposition was made by European physicians to its use. Some Protestants, indeed, went so far as to decline taking it, because it was favoured by the Jesuits. Although the bark was used for many years, it was not till Dr Gomez, a surgeon in the Portuguese navy, in 1816 isolated the febrifugal principle, and called it chinchonine, that its true value became known. But the final discovery of quinine, as it is now used, is due to the French chemists Pelletier and Caventon, in 1820. It is a white substance, without smell, bitter, fusible, and crystallised.

Chinchonine is of less strength than quinine, and is used in mild cases of intermittent fever; but in severe cases, the use of quinine is absolutely necessary. Since the discovery of the medicinal properties of this bark, it has proved an inestimable blessing to the human race. For many years the bark itself was used as a febrifuge; but quinine, which is extracted from it, is of still greater value in curing or preventing ague. On various occasions it has rendered great service by preserving the health of troops. Many lives were saved by it in the disastrous Walcheren expedition. In India it is now universally used with the same beneficial effect; and several African explorers have been enabled to prosecute their journeys through pestiferous regions by its frequent use. Dr Livingstone, among others, speaks of it as the chief remedy he has employed when attacked by sickness on his journeys.

Most of the *Chinchonae*, when growing in good soil, and under favourable circumstances, become large forest-trees. When crowded, they frequently run up to a great height without a

branch; while at the upper limit of their zone, they become mere shrubs.

There are numerous species of chinchona, producing bark of greatly different values. There are upwards of nineteen different species of the true Chinchonae, and upwards of seventy once received as such, though now considered of no commercial value. The three characteristics by which the true chinchona may be known are—the presence of curly hairs bordering the laciniae of the corolla; the peculiar mode of dehiscence of the capsule from below upwards; and the little pits at the axils of the veins on the under sides of the leaves. The leaves are of a great variety of shapes and sizes. In the finer species they are lanceolate, with a shining surface of bright green, traversed by crimson veins and petioles of the same colour. The flowers are very small, and hang in clustering panicles like lilacs. They are generally of a deep roseate colour, paler near the stalk, and dark crimson within the tube, with white curly hairs bordering the laciniae of the corolla. The colour of one species is entirely white. They send forth a delicious fragrance, which scents the air in their neighbourhood.

The region round the little town of Loxa, on the southern frontier of Ecuador, is the original home of the chinchona. In its sheltered ravines and dense forests were found those precious trees which first made known to the world the healing virtues of Peruvian bark. They grow at a height above the sea of from 6200 to 8200 feet. The trees are there from 30 to 48 feet high, with three or more stems growing from the same root. The leaves are like those already described. The bark is black when exposed to the sun and wind, but of a brownish colour when surrounded by other trees; and is always covered with lichens. The bark from the Loxa region is known as crown bark; that from Chimborazo, as red bark; while in the Huanaco region of Northern Peru grey bark is produced.

When first the demand for the bark was established, bark-collectors, called *cascarilleros*, entered the forests in parties of a dozen or more, supplied with food and tools. At their head was a searcher (*cateador*), who, climbing a high tree, looked out for the *manchas*, or clumps of chinchona-trees, which experience taught him to know by their dark colour and the peculiar reflection of the light from their leaves amidst those endless expanses of forest. Having marked the spot, he descended, and led his party, sometimes for hours together, through the tangled wilderness, using the wood-knife to mark his way to the chinchona clump. As soon as it was found, rude huts were built,

and the parties commenced their work. Having with their axes laid the tree level with the ground, cutting it as close as possible to the roots, the work of stripping off the bark was commenced. The original mode of doing this is still continued. It is done by dividing the stems into pieces of uniform length. The bark is then cut lengthwise, so as to remove the rind without injuring the wood, or severing any of the fibres. In a few days the bark is taken off in strips as broad as possible, and is afterwards pressed out into flat pieces. That, however, taken from the thinner branches is allowed to retain its form, and is known as quill bark—called by the natives *canuto*; that from the solid trunk is called *tabla* or *plancha*. It is sewn up in coarse canvas, with an outer covering of fresh hide, forming packages called *serons*. Thus prepared, it is transported to the coast for shipment.

From the careless way in which the bark-collectors have hewn down the trees, often digging up the roots themselves, the production has greatly decreased. When the root is allowed to remain, and the stem hewn as near as possible to it, an after-growth is produced, which, in the milder regions, in the space of six years again produces bark. In the colder regions twenty years are required before a tree is fit to be cut down.

With great care and trouble chinchona plants and seeds have been transported from South America to India by Professor Markham; and in the mountainous regions of the East the tree is now cultivated and flourishing. It had some years before been carried by the Dutch to Java, where, however, from want of sufficient care at first, its cultivation has not been so successful as it appears to be in India, Coca.

The native Indian, as he climbs the dizzy precipice, or passes over the rocking bridge, in his journey across the rugged mountains, or leads his troop of llamas to the seashore, or labours in the dark mines, bringing up vast weights from the bowels of the earth, is enabled to bear the fatigue he is called on to undergo by putting a few dried leaves into his mouth, which he chews, and replenishes from time to time. Thus the coca leaf is a great source of comfort and enjoyment. As he journeys, his *chuspa* or coca-bag, made of llama cloth, dyed red and blue in patterns, is hung over his shoulders. In his bag he also carries small cakes—composed of carbonate of potash mixed with lime and water—called *clipta*. Sitting down, he first puts a few leaves into his mouth, which he chews, and turns over and over till he has formed a ball. He then adds a small piece of the cake; and, sustained by the wonderful qualities of

the morsel, will go on for many hours without food. He usually replenishes his mouth about three times in the day.

The smell of the leaf is agreeable and aromatic, and gives out a grateful fragrance. When, however, used to excess, like other narcotics, coca—though the least injurious—is still prejudicial to health.

The coca plant (*Erythoxylon coca*) grows at an elevation of between 5000 and 6000 feet above the level of the ocean, in the warm valleys of the eastern slopes of the Andes, where rain frequently falls. It is from four to six feet high, with straight and alternate branches. The leaves, which are of a light green, are alternate, and in form and size similar to tea leaves. The flowers, which are solitary, have a small yellowish white corolla. It requires careful cultivation. It is produced from seeds, and the plants are then transplanted into soil carefully weeded and broken up. It is found growing on terraces on the mountainsides, which will allow of but a single row of plants. At the end of eighteen months the plants yield their first harvest, and continue to yield for upwards of forty years. The green leaves, when picked, are carefully spread out in the sun to dry. The name of "coca" is bestowed on them only when they are dried and prepared for use.

Some writers, objecting altogether to stimulating narcotics, assert that the use of coca produces all the evil results of opium; but this, from the evidence of many enlightened travellers, seems not to be the case. Taken immoderately, no doubt it is injurious,—as is tea, coffee, tobacco, or wine; but used as it generally is by the natives, it is to them a great blessing. The valleys, however, most suitable for its cultivation are reputed to be unhealthy.

So valuable was coca considered in the days of the Incas, that divine honours were paid to it, and it was especially the property of the sovereign. Even at the present day the miners of Peru throw a quid of coca against the hard veins of ore, under the belief that they are thereby more easily worked. The natives also sometimes put coca in the mouth of the dying man, believing that if he can taste the fragrant leaf it is a sure sign of his future happiness.

Its moderate use is considered wholesome; and European travellers who have chewed coca state that they could thus endure long abstinence from food without inconvenience, and that it enabled them to ascend precipitous mountainsides with a feeling of lightness and elasticity, and without losing breath.

Part 3—Chapter X.

Humming-Birds (Trochilidae) of the Cordilleras and Western Coast.

We should scarcely have expected to find the smallest specimens of the feathered tribe inhabiting the same region as the mighty, coarse-feeding condor; but whereas the latter pounces down on his carrion banquet into the plains below, the little humming-bird seeks his food from the bright flowers which clothe the mountainside, or the minute insects which fly amid them.

Humming-birds are found throughout the whole of the New World, from the borders of the great Canadian lakes, along the entire range of the Cordilleras, down to the shores of Tierra del Fuego; also in the West India Islands, and over the whole wide-extending plains watered by the Orinoco, the Amazon, and other great rivers which empty themselves into the Atlantic. The greater number of the species exist about the equator, and, as might be expected, diminish as we proceed either to the south or north.

They obtain their name on account of the humming sound which their wings produce when they are hovering over the flowers in which they seek their food. The sound, however, varies in the species; and the well-practised ear of the naturalist is often able to distinguish without difficulty one from the other. Some are furnished with strong wings, with which they can extend their flight over a large extent of country; and many are migratory. Others again have only small wings, and are compelled to remain always in the same locality. So rapid is their flight, that the eye can scarcely distinguish the little bird as it cleaves the air; and when hovering over a flower, the wings appear like filmy grey fans on either side.

The food of most species consists partly of insects and partly of the honey extracted from flowers. In order to obtain its food from the deep recesses of flowers, it possesses a long delicate beak; in some birds straight, in others curved downwards, while some, again, have a double curve. These variations in form are undoubtedly to suit the particular flowers on which they feed. By means of the peculiar structure of its tongue, which is long, filamentous, and doubled nearly to the base, it is enabled to

project it to a great distance—even into the very depths of the largest flowers.

There are upwards of three hundred species of these beautiful birds, and others are being constantly discovered—one vying with the other in beauty and richness of plumage—truly described as the “feathered gems of the mountain and forest.” Some humming-birds tower, like the lark, to a great height in the air; while others keep always near the ground, among the shrubs in which they live.

The nests of humming-birds vary in form and structure, but they are all of a most delicate nature. The external parts of some are formed of light grey lichen, and so perfectly arranged round it as to appear at a little distance as if only forming part of the branch to which it is attached. The interior consists of the silky fibres of the cotton-tree, extremely delicate and soft. The female lays a couple of eggs only, purely white, and about the size of peas. Ten days are required for their hatching, and the birds raise two broods in a season. When first hatched they are not larger than an ordinary-sized fly. Small as is the male humming-bird, he is a brave little fellow, and will courageously fly at the largest bird which approaches his nest; while, by the rapidity of his flight, he can avoid the attacks of even the swiftest of the larger race.

There is a remarkable circumstance connected with humming-birds, especially in lofty regions, where they are more particularly susceptible of electric influences. It is well known that in many regions small birds are found killed after a thunder-storm, in consequence of the amount of electricity in the air. The humming-birds, as if conscious of this danger, build their nests of peculiar form, and of materials which are bad conductors of electricity, within which they are thoroughly protected. The nests of some are shaped like inverted cones, tapering to a fine point—that, as is supposed, the electricity which would destroy the delicate young ones, or the vitality of the eggs, may pass off into the air.

Their notes are very feeble, rarely rising into a whistle. In one week after they are hatched, the young birds are ready to fly, but they are fed by their parents for nearly another week. Their plumage, however, does not attain its full brilliancy till the succeeding spring.

But we must confine ourselves to the humming-birds of the Cordilleras, on the western coast.

Sword-Bill Humming-Bird.

At the north of the range, between Santa Fé de Bogota and Quito, at an elevation often of 12,000 feet, is found the sword-bill humming-bird. Its name is derived from the length of its beak, which is nearly as long as its body, and enables it to seek its food from the long pendent corollas of the Brugmansae. Nothing can exceed the elegance of its movements as it probes the pendent blossoms, searching to their inmost depths. Its nest, woven with wonderful skill and beauty of construction, is fastened to the end of a twig. The head and upper part of the body of the male bird are green, glossed with gold in some parts, and with bronze in others. The wings are dark black-brown, with a purple gloss; while the tail is dark black, the upper surface being bronzed. A conspicuous white, slightly elongated spot exists behind each eye, and on each side of the chest there is a broad crescent-shaped mark of light green. The under parts are of a bronzed green, and the under tail-coverts are flaked with a little white.

Copper-Bellied Puff-Leg.

In the neighbourhood of Santa Fé, another very beautiful and curious little bird, the copper-bellied puff-leg, is found, at an elevation of about 9000 feet. (Unlike the greater number of birds, the female humming-birds are generally as richly ornamented as the male.) It is named from the curious white puffs or ruffs—looking as if formed of swan's-down—on the legs. The head of the male, the sides of the neck, and back, are green, with a bronzed tint, except on the tail-coverts, where the green is pure, and of metallic brilliancy. The tail is black, with a purple gloss; the throat is of a shining, metallic green; while the breast and under portion of the body is green, glossed with gold.

This bird, probably on account of the vegetation of the locality, from which it obtains its food, is restricted to a narrow mountain-ridge, not three-quarters of a mile in width.

White-Booted Racket-Tail.

The rapid flying white-booted racket-tail is likewise common near Santa Fé. It possesses muffs, like the former, and is found at an elevation of nearly 10,000 feet. It is named from the long, racket-shaped feathers of the tail, which, when flying, are in constant motion, waving softly in the air, opening and closing in the most beautiful manner. In its flight it may vie with the

arrow as it darts from a bow; and when the bird rapidly cleaves the air, the tail-feathers lie straight behind it.

The chief colour of this bird is a bronzed green, the upper tail-coverts being of a richer and redder hue. The wings are of a purple-brown, as is the tail; but the rackets are black, shot with green. The feet are yellow, with two beautiful white ruffs surrounding the legs.

Columbian Thorn-Bill.

In the same district, invariably keeping at the bottom of the valleys, is found the Columbian thorn-bill. It does not even mount, as do many humming-birds, to the tops of the trees, but seeks its food among the low, flowering shrubs. It is of a golden green colour on the upper parts, and of a dull green below; except on its curious tuft, which hangs from the chin, and is of a light green at the base, and a purple-red towards the points. The wings are of a purple-brown hue, as is the tail, with a bronzed gloss, while the under tail-coverts are brown-yellow. It is curious that the hen, though in other respects like the male, has no beard.

Black Warrior.

At the height of 13,000 feet above the ocean is found a curious bird, which, from the pointed plume crowning the top of its head, and the long beard-like projection from its chin, is very appropriately called the helmet-crest or black warrior. It inhabits regions immediately below the line of perpetual snow, where we should least expect to find so delicate a creature. Its food it gathers from the thinly scattered shrubs projecting from the ledges of rock near the snow. Its flight is swift, but very short. When launching itself from the lofty height on which it is perched, it flies obliquely downwards, uttering at the same time a plaintive, whistling sound. It is more sedate in its habits than its brethren, nor does it seem to partake of their joyous spirit. The head and neck of the male are black, with a line running along the centre. The long beard is white, and round the neck and back of the head is a broad band of white. The upper surface of the body and the two central feathers of the tail are bronzed green, the others being of a warm reddish bronze. Its length is a little over five inches.

The female is chiefly brown, and possesses no beard or helmet-like plume; it is also considerably smaller.

The Sickle-Bill.

In the humming-birds, we see the same perfect adaptation of their construction to their peculiar wants which is found throughout the whole animal creation. This is beautifully exhibited in the sickle-bill, which is occasionally found in Bogota. Its bill is very short and sharply curved, in order that it may enter the short, curved flowers of that region. It is generally of a duller hue than most of its tribe. Its head and small crest are blackish-brown, each feather having a spot of buff on its tip. The upper part of the body is of a dark, glossy green, slightly touched with buff. The under part is a brownish-black, with a few buff streaks upon the throat and breast. It is about four and a half inches long.

Mars' Sun-Angel.

Mr Gould describes the Mars' sun-angel as among the most beautiful of the genus *Heliangelus* inhabiting the northern end of the Cordilleras.

"It has all the charms of novelty to recommend it, and it stands alone among its congeners; no other member of the genus, similarly coloured, having been discovered up to the present time. The throat vies with the radiant topaz, while the band on the forehead rivals in brilliancy the frontlet of every other species. The male bird has a fiery red mark on its forehead, and the crown of the head and upper surface of the body are bronzed green. The throat is ornamented with a gorget of deep fiery red, and below it is a crescent-shaped band of light buff, while the under part is of a deeper buff, changing to green at the sides. The tail is of a bronzed brown, with the two centre feathers of bronzed green. The female is destitute of the red mark on the throat and forehead."

***Heliangelus Clarissa*.**

Another sun-angel, the *Heliangelus Clarissae*, has a deep ruby crimson gorget.

Snow-Cap Humming-Bird.

In New Granada is also found the curious little snow-cap humming-bird, one of the most rare of the Trochilidae. It is of a brown colour, with a coppery hue, in which, in certain lights, a purple reflection can be perceived. The crown of the head and the tip of the tail-feathers are of a dazzling white.

Mr Gould describes one he saw perched on a twig, pluming its feathers. At first he was doubtful whether so small an object could be a bird. It was standing over a pool of water. "At first the little creature would poise itself about three feet or so above the water, and then, as quick as thought, dive downwards, so as to dip its miniature head in the placid pool. Then up again it would fly to its original position, as quickly as it had descended. These movements of darting up and down it repeated in rapid succession, producing a wonderful disturbance of the surface of the water for so diminutive a creature. After a considerable number of dips it alighted on a twig near at hand, and commenced pluming its feathers."

Spangled Coquette.

The spangled coquette, like all of its genus, possesses a well-defined crest on the head, and a number of feathers projecting from the neck. This singular crest it can raise or depress at will, producing a curious effect in the appearance of the little bird. When depressed, the crest lies flat, and projects on either side, so that the sparkling eyes can scarcely be seen. The crest and feathers projecting from the neck are of a light, ruddy chestnut, the latter having dark bronzed green spots on the tip. The head is of the same colour; the throat and face of a lustrous green. Below the gorget projects a small crossing from side to side, and the rest of the plumage is of a dark, ruddy chestnut colour. The female has neither crest nor gorget.

Train-Bearer (*Leobia Amaryllis*).

Professor Orton tells us that the valley of Quito swarms with those winged jewels—of varied hue—the Trochilidae.

Among them is the train-bearer, which, small as it is, has a straight tail nearly six inches in length.

Hill Star.

The neighbouring heights of Chimborazo and Pichincha are adorned with two beautiful little creatures, well called "Hill Stars;" and it is curious that the hill star of Chimborazo never visits Pichincha, nor does the latter ever approach Chimborazo. They are very like each other; but while that of Chimborazo has a triangular green spot upon the throat, it is wanting in the Pichincha hill star. The colour of the upper part of the Chimborazian hill star is of a somewhat dark olive-green, except the wings, which are of a purple-brown tint. The under parts are

white; but they deepen into a dusky black upon the under tail-coverts. The head and throat are of the most glorious blue, with the exception of the before-mentioned emerald-green patch on the centre of the throat, which is of a triangular form, one angle pointing upwards. It has a broad collar of velvety black round the neck, the dark hues of the head contrasting curiously with the dark body. In the tail there are two white feathers, edged with greenish-black. The hen is of a more sombre hue, having an olive-green head, and the throat white, spotted with green.

The Sappho Comet.

Proceeding southwards, we find numerous beautiful humming-birds in Bolivia. Among them is the sappho comet, or bar-tailed humming-bird. In winter it descends into the lowlands of Peru, among the abodes of men, visiting their gardens and orchards with perfect fearlessness. The larger part of the plumage is of a light green, the lower portion of the back a deep crimson-red. The throat is metallic green, and the wings are purple-brown. The base of the tail is brown, but the greater part is of a fiery hue, tipped with velvety black.

As it darts from flower to flower—now describing a circle, now turning and performing numberless other evolutions—the eye is unable to follow it, and it is lost to sight, until it again returns to the flower which at first attracted its attention.

On arriving at its winter abode, it takes up its residence in the shrubberies and gardens of the Indian cottages, says Mr Bonelli. The hill-side of the neighbouring country, clothed with the indigenous trees and shrubs, also affords it a fit place of abode, whence it descends several times a day to the cultivated plains below, particularly to the fields of maize and pulse, and other leguminous plants. The rich flowers of the large cacti are also frequently visited, as they afford it a constant and abundant supply of insect food.

The nest is a somewhat loose structure, outwardly composed of vegetable fibres, slight twigs, and moss, and frequently lined with soft hair. The lower portion is prolonged considerably below the cup-shaped interior, which is about an inch and a half in diameter, and an inch in depth; the total length of the nest being nearly three inches. The nest is placed against the sides of the walls, supported by any hanging root or twig that may be best adapted to afford it security. The eggs are two in number, and oblong in form, of a pure white, half an inch in length, by about five-sixteenths of an inch in breadth.

The Phaon Comet—Blue-Tailed Sylph.

The phaon comet is considerably larger, but very similar to the former, except that the whole of its tail is of a crimson-red.

The blue-tailed sylph has a wide range along the temperate regions of the Cordilleras. The genus of sylph to which it belongs is among the most beautiful and graceful in form of the humming-birds. The body is of a bronzed green, and the crown of the head of a metallic golden green; while the throat is adorned with a gorget of the most intense purple-blue. It has a superb tail, the two central feathers of which are of a shining metallic green; the two next are black at their base, and rich blue towards their extremities, tipped and edged with bright metallic green, shot with blue.

But we have not space to describe one-tenth part of those wonderful, bright, and small specimens of the feathered tribe which inhabit the mountains for their entire length. Darwin found one of the species—the *Trochilus forficatus*—flying about amid the snow-storms in the forests of Tierra del Fuego; while in the wooded island of Chiloe, which has an extremely humid climate, he saw it skipping from side to side amid the dripping foliage.

In the same island is found another species, the *Trochilus gigas*—a very large bird for so delicate a family. When on the wing, it moves from place to place with the most rapid flight; but whilst hovering over a flower, it flaps its wings with a very slow and powerful movement, totally different from that of the vibratory one common to most of the species which produces the humming noise. When hovering by a flower, its tail is constantly opened and shut like a fan, the body being in a nearly vertical position. This action appears to steady and support the bird between the slow movements of its wings. It feeds chiefly on insects. The note of this species, like that of nearly the whole family, is extremely shrill.

In Bolivia are found the Bolivian violet-ear, Warren's wood-star, and many others; but we must bring our description of the humming-birds of this region to a conclusion.

Part 3—Chapter XI.

Mammalia.

The Savage Inhabitants of the Amazonian Valley.

Full of animal life as are the forests of South America, the number of species of what are generally called wild beasts is remarkably small. Four only are capable of attacking man—the jaguar, the puma, the great ant-eater, and the savage little peccary, with its lancet-like tusks. The first only is universally dreaded; the puma flies when bravely confronted; the great ant-eater is not dangerous, except to those who get within its reach; and the peccary is dreaded chiefly when hunting in a pack, as it does, like the wolf. The burly tapir, the largest animal of the continent—though a hippopotamus would look at it with contempt—is perfectly harmless; and, with the exception of a few species of tiger-cats, nearly all the other Mammalia are rodents, or belong to the order Quadrumana. The latter are by far the most numerous inhabitants of its wide-extending forests. It is especially the country of monkeys, where they have arrived at their highest development. Several of the species are not only furnished with four hands, but they have tails which serve them, to all intents and purposes, as a fifth hand. They can hang by them, or insert them into a hole and pick out a bird's egg, or a minute insect, with the greatest ease. They are generally, with the exception of the howlers, amicably disposed, easily tamed, with beautiful coats of fur, and, if not exactly elegant in their forms, very agile, and generally attractive, interesting little creatures.

The serpents and insects are far more dreaded and annoying than the wild beasts. Many of the former are fearfully venomous. The boa occasionally finds a human being in the forest, sick or wounded, and unable to fly, and winds its huge coils round his body. The anaconda is equally dangerous to those sleeping near the river's edge; while the cunning and savage alligator lies in wait for the unwary bather or drawer of water who ventures into the stream; and termites and ants devour the stores of the inhabitants, and, in certain localities, well-nigh sting them to madness.

The Puma.

The gaucho of the Pampas, the llanero of the savannahs in the north, the herdsman on the slopes of the Cordilleras facing the Pacific, and the settlers on the eastern shore, dread the wide-ranging puma—or the American lion, as the creature, on account of its tawny hide, is wrongly called. Supplied with powerful limbs, capable of climbing tall trees and swimming rivers, neither mountains, forests, open plains, nor streams stop

its progress. Like the cat, to which genus it belongs, it stealthily approaches its prey, and, seizing it with a sudden spring, rends it to pieces. When coming upon a flock of sheep or vicuñas, it deals havoc and destruction on every side, often striking down in mere wantonness a far greater number than it can carry off or devour. Yet, though far larger than the jaguar, it is inferior to it in courage, and, when boldly opposed by man, will always take to flight; though, like the jaguar, it will track a human being through the forest, in the hope of springing on him when unobserved. Yet, boldly faced, it plays the coward, and will creep off, unable to stand man's steady gaze. Like a wild cat, it climbs a tree with ease; and, taking post on a branch, crouches down, stretched out at full length along it, its colour harmonising with the bark, so that it cannot be seen by its unwary prey moving near it. As the deer or vicuña passes below, it launches itself on the doomed creature, and, drawing back its neck with its powerful claws, breaks the vertebra, and instantly kills it. Darwin states that he has frequently seen skeletons of huanucus with their necks thus dislocated.

In the Amazonian forests the puma is not so common as the jaguar. The colour of its fur resembles that of the deer in these forests. The natives call it the *sassu-arâna*, or the false deer, as it frequently, in consequence, deceives them at first sight. "It was from this name being misspelt that it is called the *cuguacuarana*, the first *c* being soft," observes Bates. Hence the name cougar, employed by French zoologists, and copied in most works on natural history. The hunters do not fear it, describing it as a coward; and such, in spite of its strength, it undoubtedly is. Still, instances have occurred of its killing human beings.

It is often found at an elevation of upwards of 10,000 feet. After killing an animal and eating its fill, it covers over the carcass with bushes, and lies down to watch it. This habit frequently causes its destruction, for the condors, attracted by the carcass, assemble from far and near to their expected feast, when the puma springs out to drive them off. The gauchos of the Pampas, observing the birds rise together on the wing, hurry with men and dogs to the chase. Whirling their bolas round their heads, they quickly entangle the animal's limbs, and then, throwing their lassoes over it, drag it along the ground till rendered insensible, when its brains are quickly beaten out. In Chili it is hunted with dogs, or, driven up a tree, is easily shot. It is noted for its craft. When once it has been betrayed when watching a carcass, and has managed to make its escape, it is said never to resume that habit. When pursued it will stop and spring on

one side, and wait till the dogs have passed by. Unlike the jaguar, which is among the most noisy of beasts of prey, the puma seldom utters any sound, even when wounded, but silently takes its way, its presence only known as it makes the fatal spring on its victim.

The Jaguar.

The Indian, as he roams through the forest, turns many a cautious look over his shoulder, lest the savage jaguar, with stealthy feet, may be following his trail. Meeting the monarch of his forests face to face, he fears it not, provided he is armed with a bow and poisoned arrows, or sumpitan and envenomed dart, which will soon compel the fierce creature to succumb to its deadly influence.

Of the jaguar, or ounce (*Felis onca*), there are two species—the one of a palish brown-yellow, variegated on the upper parts of the body with streaks and regular oblong spots of black; while the other is of a general black hue, and is considered the more savage of the two. It reaches a size which may vie with the tigers of India, though it is often not much larger than a wolf. It is frequently called the tiger or panther of the New World. The tail is not so long as the body. In outward appearance it closely resembles the leopard, especially in its arboreal habits, as by means of its powerful claws it can with ease spring up the trunk of a tree, and make its way along the branches, ready to pounce down upon a foe. Nearly every creature of the forests and arid plains over which it roams, and many which frequent the margins of the rivers and lakes, have to dread its voracious jaws. It will spring from the bough, along which it lies crouching, on the back of the thick-skinned tapir, which, with those powerful claws clinging to its hide, dashes terror—stricken through the thickets, endeavouring to shake off its foe. It will even fearlessly attack the alligator, in spite of the latter's enormous jaws,—avoiding which, by its agility, it will tear open the reptile's side, and devour it before life is extinct. It lies watching from a projecting trunk for the huge manatee swimming by, and grappling it with its claws, holds it fast in the struggle for life and death, by degrees dragging the vast body out of the water, and never letting go its grasp till it has succeeded in capturing its prey. Turtles become its easy victims. Watching for them as they crawl up the sandy banks, it turns them helplessly over with its paws. The capybara, or water-hog, seems born for the especial purpose of serving it as food, enormous numbers of that big rodent being devoured by it. Even active monkeys cannot escape it. It will climb the trees

and surprise them when sleeping; or sometimes, lying in concealment, springs out among a troop of them joyously gambolling, unsuspecting of danger, when their shrieks of terror and the hoarse roar of the jaguar may be heard resounding through the forest.

But where flocks and herds are collected in the neighbourhood of man's abode, the jaguar is especially dreaded, as it will spring upon a horse and bring it to the ground with ease; it has been known to drag one many yards to the water's side, and swim across the river with its prey, carrying it away on the opposite side to its home in the forest. Sheep and deer fall easy victims. When seizing a deer or horse, it leaps on the animal's back, and grasping the head with its claws, wrenches it back till the vertebrae of the neck are broken.

There are but two animals who do not fear the jaguar. The great ant-eater is defended from the monster's attacks by its shaggy, thick coat. It will often grasp the jaguar in its powerful claws, and keep it in a close embrace, while these formidable weapons tear open its side—treating it as some chiefs in India were in the habit of treating their guests, whom they pretended to receive with an embrace of friendship, their hands armed with the steel-formed claws in imitation of those of tigers. Though the savage little peccaries, when caught singly, are quickly despatched by the jaguar, yet when meeting it collected in a herd, they so fiercely assault it with their sharp tusks, that it is either pierced to death, in spite of the blows of its claws, or compelled to take to flight.

It catches fish as it does the manatee, suddenly thrusting forth its talons as they pass below it; while it scrapes up the turtle's eggs in numbers. It even pounces on birds and lizards, in spite of their activity and means of escape; and, when pressed by hunger, it will attack a native village, and carry off, not only fowls and other tame animals, but the children, and sometimes full-grown people, whom it may catch unawares.

Darwin says, that when the floods drive these animals to drier ground, they are most dangerous; and mentions many instances of people being destroyed by them. On the Parana they have been known to get on board vessels at night. He heard of a man who, coming up from below when it was dark, was seized on the deck by a jaguar. He escaped, however, with the loss of the use of an arm. At Santa Fé, two padres entering, one after the other, a church into which a jaguar had made its way, were both killed. A third, who came to see what was the

matter, escaped with difficulty. The beast was destroyed by being shot at from a corner of the building which was unroofed.

The gauchos say, that when wandering at night, it is frequently followed by foxes yelping at its heels. If such is the case, it is a curious coincidence with the fact, generally affirmed, that jackals accompany the East Indian tiger.

The jaguar often leaves marks on the bark of trees, which it scrapes for the purpose of tearing off the rugged parts of its claws; a habit common also to the puma, as Darwin says he frequently found in Patagonia scores so deep on the hard soil, that no other animal could have made them.

Brett mentions several instances which came under his notice of human beings being killed by jaguars. A Carib Indian had gone into the forest to procure touari,—the inner bark of the sapucaya-nut tree, of the thin papery layers of which the Indians form the envelopes of their cigarettes. While employed in cutting off the long strips of the bark, on turning round he discovered a jaguar stealthily approaching. His friends, as he did not return, set out in search of him. For a whole day they searched in vain; but on the second they discovered his foot-tracks, and those of a large jaguar. Following these for a long way in anxious suspense, they at length came to a spot where there were marks of a conflict, and they discovered their comrade's bow lying broken on the ground. Still it was apparent that the Indian had beaten off his assailant, for the tracks of both led still further into the forest. At length they reached the scene of the last desperate struggle. On the ground lay the man's knife, which he had lashed to the end of a stick; but it had been loosened and turned aside against the tough hide of the animal. From the marks on a tree it was evident that the poor fellow, in dire extremity, at the approach of night, had been trying to climb it, but ere he had ascended ten feet the jaguar had sprung after him, and pulling him down, had torn him to pieces. The remains, terribly mangled and half-devoured, lay near. One of the Caribs who had found the body described the sickness which came over him at the sight, and remarked that he had never since felt secure when traversing the forest with only his knife and bow and arrows. On the banks of the Pomaroon lived a Carib family, with a number of small children. The young ones had gone into the water to bathe, when they were startled by the cry of the smallest of their party—a little boy—whom they had left seated at the water's edge. On looking round they beheld a huge jaguar which had been attracted by their noises of splashing, and which, having come behind the

poor child, was standing with one paw on his shoulder. The elder children, screaming for help, attempted bravely to drive away the savage beast, but their efforts only resulted in it seizing the poor little fellow's head with its powerful jaws. It was a moment of agony. Their father was absent, but another Carib who was near rushed to the spot, followed by the child's mother and some other females. The beast, startled at this sudden increase in the number of its assailants, dropped its victim, whom the man immediately took up and gave to the mother. But assistance had come too late. The child gave his last struggle as his mother received him in her arms. When night set in, the disappointed beast came back to claim his prey, roaring and yelling through the hours of darkness around the open shed which formed their dwelling. Females alone were present, as the man had gone off to call the child's father; and they had great difficulty, with firebrands and shouting, in keeping the brute off till help arrived.

Some time after this, another man, of considerable personal strength and cool courage, was one day in his field, with a little dog playing by his side, when he saw a jaguar at a distance watching his movements. The beast slunk away when observed, and as the Carib had no gun, he went on quietly with his work, clearing away the bush with his cutlass, which was a new and sharp one. The jaguar had, however, marked the dog for its prey, and only retreated to execute a flank march through the bush, and to come unperceived on his rear. Having effected this, it crept noiselessly forward, and sprang on the dog, which was instantly killed. The Carib rushed to the assistance of his favourite, compelling the savage jaguar to relinquish its hold, but the creature turned and sprang upon him. The man, however, anticipating the attack, dashed forward and decided the contest by a single blow, which buried his cutlass deep in the jaguar's skull. The same man, on another occasion, clove the skull of a second jaguar with an axe with which he was about to fell some trees.

The jaguar, however, is capable of being tamed. The well-known Captain Inglefield possessed one, afterwards placed in the Zoological Gardens. It was so tame that he used to lie down and place his head on its body as on a pillow. It was allowed to roam at liberty about the ship. It was remarkable, however, that this creature could never be trusted when a young child or a dog was present. On such occasions it became greatly excited, endeavouring to break away from the chain with which it was secured when on shore. Probably in its native wilds both would have fallen victims to its natural ferocity.

The Bishop of Demerara witnessed an instance of the way in which these savage creatures may occasionally be tamed, while on an expedition up the River Demerara. On approaching the falls, he and his party halted at an Indian settlement on the left bank, where they saw a young jaguar only a few weeks old, which appeared to be extremely savage, when any of them went near it. "But," he continues, "never did I observe such apparent gentleness and attachment in any animal; as, when one or two of our party had certainly not gone the way to win the creature's affections, it allowed itself to be drawn close to us by an Indian woman, and afterwards by a little child. Not a moment before, it was as angry and savage as could be; but no sooner did the child draw it towards her, than, looking up with an expression of intelligence and trustfulness quite new to me, it nestled itself within the embrace of its kind protectress."

The Indians are proverbially famous for the facility with which they attract animals towards them. Bates and Wallace also mention having seen, on several occasions, jaguars perfectly tame, roaming in and out of the huts, as their smaller feline relatives would have done.

Ant-Eaters.

Within the recesses of the primeval forest, near the borders of a river or lake, a large mass of what looks, at a little distance, like a collection of some long, coarse, curled, fibrous substance, is often seen by the hunter. The jaguar glances at it askance and passes it by,—although, when hunger presses him, he may long to obtain the dainty meal which lies beneath. The huge hairy mass is the tail of the ant-bear, which serves it as a shelter from the rays of the noonday sun and from the deluges of the rainy season: spread out over its body, it is the sole covering it seeks, as it neither burrows, nor takes up its abode in the hollows of trees nor in artificial caves. With its elongated toothless head and thin tongue, it seems utterly incapable, at the first glance, of defending itself, not only against the jaguar or puma, but, notwithstanding its great size, against even the attacks of the smallest carnivorous animals of the wilds, as it moves with toilsome and awkward steps over the ground. It cannot climb the trees; unadapted for swimming, it dare not seek safety in the water; and incapable of moving rapidly, it is unable to run from its foes. Its hind-feet, unlike those of many animals, are valueless for defence; but yet it has not been left without ample means of protection. Examine its fore-feet, and on each will be seen two large, powerful, trenchant claws. With these, aided by its muscular power, and thick hide covered with

long coarse hair, it boldly defies the attacks of the fiercest creatures.

Of a peaceable disposition, it makes its solitary way through the forest; but woe betide the hunter's dogs, or any other animals, which venture to assail it! With one blow of these sharp weapons it rips up its assailant, or hugs it in a close embrace, where its own thick skin resists the teeth of its foe; and, able itself to endure hunger longer than any other animal, it keeps it thus till starved to death.

Vast numbers of ants and termites swarm in the tropical forests of South America, of great varieties of form and mode of life and occupation. Their business in the economy of nature is chiefly the consumption of decayed vegetable matter, which would otherwise contaminate the atmosphere. They are furnished with incalculable powers of increase, and, to prevent their too great excess, other animals have been created to prey on them. The chief creature engaged in that work is this most extraordinary denizen of the forest—the ant-bear, or great ant-eater (*Myrmecophaga jubata*), called also the tamanoir. It often measures, from the tip of its snout to the extremity of its tail, eight feet; and though it seems wonderful that so large an animal should be able to subsist solely on such minute insects, yet, from the formation of its mouth, it is unable to consume any other. It has a long slender head, with a pointed snout; and its mouth, entirely destitute of teeth, is furnished with a long flexible tongue, covered with a glutinous saliva. This it passes lightly over the swarms of ants which rush out when it attacks their dwelling, and they, adhering to it, are speedily dragged into its maw.

Its body is covered with long, coarse, shaggy hair, except on the head, where it is short and close; while its black bushy tail is of great size and length. It is plantigrade—that is, it stands lower on the hind-legs than in front. Though its mouth appears so incapable of enabling it to defend itself, it can do so effectually with the two long, sharp claws of its fore-feet. With these claws it opens the ant-hills, on whose inhabitants it subsists. Its hind-feet have five toes, but they are furnished with short, weak claws, similar to those of ordinary quadrupeds.

Its favourite resort is the low swampy marshes of the rivers and stagnant pools; but it also ranges widely in search of its prey. It lives in solitude; its habits are slothful; it sleeps during the greater part of the day. Its long claws, when not employed, are folded upon a thick rough pad, which renders the exertion of walking less difficult. As, however, it is compelled to step upon

the outer edge of its fore-feet, it progresses in an awkward and painful manner, and it cannot move for any length of time. Its eye possesses a peculiarly cunning expression.

Of a peaceable and harmless disposition, the ant-bear, when not provoked, never attacks any animal; but on the approach of an enemy, it assumes the defensive in such a way as to make the boldest aggressor pause. Resting on its left fore-foot, it strikes out its right with a force sufficient to tear off the hide of the thickest-skinned assailant. When attacked from behind, it turns round with the rapidity of lightning; and when assailed from several quarters at once, it throws itself on its back, fighting desperately with both its fore-legs, and uttering angry growls of defiance. So thick is its hide, that no animal has been found with teeth capable of piercing it; and even when the jaguar, pressed by hunger, dares to assail it, the monarch of the American forest is often driven off, or left weltering in its blood from the wounds inflicted by the formidable claws of the ant-bear.

When attacking an ant-castle, the tamanoir strikes a hole in the wall of clay with his powerful, crooked claws. The warrior-ants then issue out by thousands to resent the insult, while the labourers retire to the inmost recesses. The soldiers swarm on every part of their assailant, but their sharp mandibles are unable to pierce its thick skin. The bear then putting forth its long tongue, which is lubricated from two large glands situated below its root, the insects remain sticking in the glutinous liquid. When a sufficient supply has been thus obtained, it draws back its tongue within its mouth, and swallows the whole army at a gulp.

Myrmecophaga Tamandua.

While the vast citadels of the white ant formed on the ground are attacked by the great ant-eater, the too great increase of the arboreal termites is kept under by three smaller species, formed to live among the branches of the trees.

The tamandua is seen climbing the loftiest monarchs of the forest in search of its insect prey. It is about the size of a cat. Though its head is elongated, it is considerably less so than that of the ant-bear; while its hair is short and silky, resembling fine wool. The feet are formed in the same manner as those of the larger animal, but, to enable it the better to climb among the branches, it possesses a prehensile tail.

Though it cannot be said to possess a sweet tooth—as its mouth is as destitute of teeth as that of the tamanoir—yet it does not confine its food to the termites alone, but seeks the nests of the stingless bees, which form their hives among the loftiest branches of the forest, and robs them of their honeyed treasures.

Little Ant-Eater.

There is another curious little ant-eater, about the size of a squirrel,—which animal it resembles very much in its habits, and somewhat in its appearance. It possesses a prehensile tail, like that of the ateles and other American monkeys, with which it can swing itself from branch to branch. The tail is covered with fur, with the exception of about three inches of the under surface at the extremity. It has a small head, the snout sharpened and bent slightly downwards. A soft, curled, and pale yellow-brown fur clothes its body. It has only two claws on each of its fore-feet, the exterior one being stronger and larger than the interior. With these weapons it is enabled to hook out the small insects from the crevices of the bark, or grubs from the nests of bees or wasps. Like the squirrel, it sits upon its hind-limbs when eating, supporting itself with its prehensile tail. It may more properly be called the twisted-tail ant-eater (*Cyclothurus didactylus*).

There is another small ant-eater found in Guiana, called the striped ant-eater (*Myrmecophaga striata*), from the marks on its body. Its general colour is of a tawny hue, the under parts being white. It is marked with broad, distinct, blackish transverse stripes, and the tail is annulated with similar ones. Its whole length, from the tip of its nose to the end of its tail, is about twenty inches. The snout is elongated, the upper mandible extending very little beyond the lower.

The Sloth.

That shaggy-haired creature, which may be seen hanging from the boughs of the lofty cecropia—the much-abused sloth—is generally described as a type of laziness, doomed to a helpless and wretched existence; but such an animal the all-beneficent Creator has not placed on the earth. To each animal that he has formed he has given an instinct and organisation specially adapted to their mode of life and the part they are destined to perform in the economy of nature. The sloth is formed to pass its time in trees, and to feed on the superabundant leaves, which would otherwise impede the circulation of the air, retard

their growth, or bring on premature decay. This duty it shares with numberless other animals of the luxuriant forests of Tropical America. Place the sloth out of its natural position, and, as would be the case with other animals, it finds itself in a difficulty. Its destiny is to live in the dense forest, where, the branches of the trees meeting each other, it can move along from bough to bough, and make its way for considerable distances without difficulty, or having to descend to the ground. When by force or accident placed on the ground, it is unable to move along except at a slow and toilsome pace. When by any chance thus seen, its arms appear much too long, while its hind-legs, which are very short, look as if they could be bent almost to the shape of a cork-screw. Both fore and hind-legs, by their form, and the manner in which they are joined to the body, are incapable of acting in a perpendicular direction, or in supporting its body. Hence its belly touches the ground. Even could the animal thus raise itself, it would be in pain, as it has no soles to its fore-feet, and its claws are very sharp, long, and curved. Thus, were its body supported by its feet, it would be on their extremities; just as a man would be were he to go on all-fours, and try to support his body on the ends of his toes and fingers. "Were the ground polished like glass," says Waterton, "the sloth would actually be quite stationary; but as it is generally rough, the sloth moves its fore-legs in all directions, in order to find something to lay hold of; and when it has succeeded, it pulls itself forward, and is thus able to travel onwards, though in a slow and awkward manner. Indeed, as its looks and gestures betoken its uncomfortable situation, and as a sigh every now and then escapes it, it may be concluded that it actually is in pain."

Thus it is evident that the sloth is formed, not to live on the ground, but in trees; and on further observation it will be seen that, unlike most other arboreal animals, it lives, not on the branches, but under them. It moves, suspended from the branch; it rests, suspended from the branch; and sleeps, suspended from the branch. "Hence its seemingly bundled position is at once accounted for," adds Waterton; "and in lieu of the sloth leading a painful life, and entailing a miserable existence on its progeny, it is but fair to conclude that it enjoys life as much as any other animal, and that its extraordinary formation and singular habits are but further proofs to engage us to admire the wonderful works of Omnipotence."

In proportion as the sloth's organisation unfits it for terrestrial progression, it is wonderfully adapted for climbing trees. With its long arms it reaches right up, and clings to the branches with

its long and crooked claws. It has thus the power of grasping a tree which no other mammal possesses. It is indeed the best climber among mammals, while it is the only mammal that can neither walk nor stand. When sleeping, the sloth does not hang head downwards, like the vampire, but supports itself from the branch parallel to the earth. It first seizes the branch with one arm, and then the other, and then brings up both its legs—one after the other—to the same branch, so that all four are in a line.

It is almost tailless. Had it a tail it would be at a loss to know what to do with it in this position. Were it to draw it up between its legs, it would interfere with them; and were it to let it hang down, it would become the sport of the winds.

Waterton observes that he has never seen a tree entirely stripped of its leaves; indeed, he believes that by the time the animal had finished the last of the old leaves, there would be a new crop on the part of the tree it had stripped first, ready for him to begin again, so rapid is the process of vegetation in that region. In calm weather it remains tranquil, probably not liking to cling to the brittle extremities of the branches, lest they should break with it in passing from one tree to another; but as soon as the wind rises, the branches of the neighbouring trees become interlocked, and then the animal seizes hold of them, and pursues his journey in safety, travelling at a good round pace—showing that he does not deserve the name of sloth.

The head of the sloth is short, the face small and round, the hair coarse and shaggy. There are several species, differing considerably in colour, but resembling in general dry, withered grass, or moss. The species vary in size from two feet to the size of a rabbit. Its face resembles the human countenance as much as that of the monkey, but with a very sad and melancholy expression. It brings forth its young and suckles them like ordinary quadrupeds. The infant sloth, from the moment of its birth, adheres to the body of its parent, until it acquires sufficient size and strength to shift for itself. Its cry is low and plaintive, resembling the sound of "ai." Hence the three-toed sloth has obtained the name of the ai.


Mr Bates says that the natives consider the sloth the type of laziness, and that it is very common for one native to call another—reproaching him for idleness—"beast of the cecropia tree;" the leaves of the cecropia being the food of the sloth. "It is a strange sight," he adds, "watching the creature's movements from branch to branch. Every movement betrays not indolence, but extreme caution. It never loses its hold of

one branch without catching the next; and when it does not immediately find a branch to grasp with the rigid hooks which serve it for paws, it raises its body, supported by its hind-legs and claws, and feels round in search of a fresh foothold." In one of their voyages, he and Mr Wallace saw a sloth (*Bradypus infuscatus*) swimming across a river, at a place where it was probably three hundred yards broad. It is not generally known that this animal takes to the water.

The Tapir.

Throughout the densely-wooded regions on the banks of the rivers from Demerara, across the Brazils, to Paraguay, the long-nosed tapir has its range. It and the peccary are the only two *Pachydermata*, or thick-skinned animals, indigenous to the southern continent. It is considered one of the links which connect the elephant and rhinoceros to the swine; its habits, indeed, are somewhat similar to those animals.

Six feet in length, and four in height, it is the largest quadruped in South America. In form it is somewhat like the hog; but its snout is lengthened into a flexible proboscis, which resembles the rudiment of the elephant's trunk, and serves for the same

purpose—that of twisting round the  launches of trees and tearing off the leaves, on which it partly feeds. Like the rhinoceros, it delights in water, is a good swimmer and diver, and enjoys wallowing in the mud.

Though in its wild state its food consists of the shoots of trees, buds, wild fruits, gourds, and melons, when in captivity it is an indiscriminate swallower of everything, filthy or clean. During the day it remains concealed in the deep recesses of the forest, issuing out at night to seek its food. On its front feet are four toes, but there are only three on the hinder—their tips cased in small hoofs. The eyes are small and lateral, and the ears long and pointed. The teeth are strong and powerful, to enable it to crush its food, or defend itself against its enemies. The hair, of a deep brown, approaching to black, is short, scanty, and closely depressed to the surface; while it has little or no tail. It possesses enormous muscular power; and as its body is defended by a thick, tough hide, it can force its way through the dense underwood where no other creature can penetrate. Generally it moves in a trot, but when pursued breaks into an awkward gallop, carrying its head downwards, like the hog.


Its chief enemy is the fierce jaguar, which, leaping on its back, endeavours to bring it to the ground. The tapir, on being seized,

darts through the forest, attempting to destroy its foe, and dislodge it from its back by rushing under the low boughs of the trees. Should this fail, and water be near, it quickly frees itself by diving down—as the jaguar, unable to dive, must either let go its hold or be drowned.

Of a peaceful and harmless disposition, it never willingly attacks man or beast; but when hunted and brought to bay, it will defend itself desperately, frequently inflicting, with its strong teeth, severe wounds on its assailants.

The Peccary.

The only other pachydermatous animal besides the tapir indigenous to South America is the little truculent peccary—a herd of which creatures is more feared by the natives than the jaguar, boa, or anaconda. There are two species—the *Dicotyles tajacu* and *Dicotyles labiatus*, or white-lipped peccary; the latter being the larger and fiercer of the two. The peccary is very like a small hog. Its form is short and compact, thickly covered with strong, dark-coloured bristles, except the lower part of the body, which is nearly destitute of hair. It has a somewhat large

head, short snout, and  short, upright ears; while a fleshy protuberance is its representative for a tail. At the first glance it seems harmless enough, but inside its mouth are found some short tusks, double-edged, and as sharp as lancets, with which the creature is capable of inflicting the most deadly wounds. It is remarkable for a glandular orifice at the lower part of the back, surrounded by strong bristles. From this gland exudes a strong-scented fluid; so that, as soon as the creature is killed, it is necessary to cut it out, or the rest of the flesh becomes so imbued as to make it unfit for food.

In its habits it is like the hog, and lives on the same kind of food, but its chief duty in the economy of nature is that of destroying reptiles and snakes of all sorts,—particularly the rattlesnake, which it attacks without the slightest hesitation; nor does it appear to suffer in any way when bitten. It gives voice with a sharp, shrill grunt; but when angry, it smartly clashes its tusks together, making a sound heard at a considerable distance, and announcing its approach.

The flesh is somewhat dry and insipid, and entirely destitute of fat. That of the female is considered the best.

The larger species—the white-lipped peccary—is dreaded by the farmers, as it frequently, in large numbers, attacks their crops, choosing always the most flourishing fields.

The peccary, though occasionally found by itself, is a gregarious animal. A herd will attack a jaguar or puma, and even the sturdy tapir, without fear; and rushing at their antagonist with their sharp tusks, never fail to come off victorious. Knowing their power, the jaguar, when meeting a herd, flies through the forest to avoid them. When the hunter and his dogs encounter one of these armies, his only chance of escape is to climb the nearest tree, when they can only stand below gnashing their teeth, and gazing up at him with their vindictive little eyes. His dogs, however, quickly fall victims to their fury.

On one occasion a party of hunters had brought a bear to bay, when, in the midst of the fierce contest, a herd of peccaries came charging over the ground, putting not only the bear, but the men and the dogs to flight.

The peccary will, indeed, attack man or beast without hesitation, its assaults being not the less dangerous because it seems utterly ignorant of the danger it runs itself. It is, however, hunted by the natives for the sake of its flesh. It frequently takes up its abode in some forsaken burrow or the hollow of a tree. The creatures back in, one after the other, till there is no room for more. The outer one then takes the post of sentinel, and gives notice of the approach of any desirable quarry. The hunters, aware of this habit, cautiously—sometimes with firearms and sometimes with pointed weapons—approach the peccaries' abode. A slight noise draws the sentinel from the hollow, when it is immediately shot down or transfixes by a spear. Another at once takes its place, coming out to see what is the matter, when it is killed in the same way; and thus a whole family may be killed in detail.

Hydrochaerus Capybara.

In all parts of the continent,—on the banks of the streams flowing through the Llanos of Venezuela, as well as by the side of the La Plata and its tributaries,—the capybara, the largest rodent in existence, may be seen, seated on its haunches, like others of its family. It is of the size of a moderately large hog about two years old. It has a large head, and thick divided nose, on each side of which are long whiskers. The ears are small and rounded; the eyes are black and of considerable size; and the upper jaw much longer than the lower,—which gives the face a

curious appearance. The body is thick, covered with short, coarse brown hair, and destitute of a tail. The neck is short, as are the legs—with remarkably long feet, which are also very broad, the claws of a blunt form, and approximate in shape to the hoofs of the Pachydermata. They are partly webbed, and thus adapted to the aquatic life it enjoys, and which has gained for it the name of the water-hog. Though it feeds on vegetables, it is also fond of fish, to catch which it enters the water, swimming after them with the rapidity of an otter. When seen at a distance as they run over the ground, from their colour they look like pigs; but when seen seated on their haunches, attentively watching any object with one eye, as is their habit, their true character is known.

Darwin describes his observing a party of several. As he approached nearer and nearer they made their peculiar noise,—which is a low, abrupt grunt, not having much actual sound, but rather arising from the sudden expulsion of air. The only noise like it is the first hoarse bark of a large dog. Having watched them from almost within arm's-length and they him for several minutes, they rushed into the water with the greatest impetuosity, emitting at the same time their usual bark. After diving a short distance they came again to the surface, but just showed the upper part of their heads. When the female is swimming and has young ones, they are said to sit on her back.

The capybara is classed with the Caviidae or guinea-pig tribe. When not persecuted, it is very tame; but in the regions frequented by the jaguar it becomes his easy and constant prey. It is of a mild disposition, and is sometimes tamed. Its flesh is rather dry, and has a somewhat musky flavour, but affords wholesome food to man.

Agouti Dasyprocta.

Of agoutis there are several species. The larger agouti, mara, or Patagonian cony—twice the size of a hare—are seen three or four together, hopping quickly one after the other in a straight line across the Pampas. It is somewhat like a hare, but has the external covering of a hog, its long coat concealing its little stump of a tail. It has also the hog's voracious appetite.

It is fond of occupying the burrows of the bizcacha when it finds them, but when they do not exist it is compelled to make a house for itself. It here stores away the food it does not require for present use. When eating, it sits up like the squirrel, using its fore-paws to convey the food to its mouth. Its hind-legs

being very long, it leaps over the ground at considerable speed. As it is very fond of the sugar-cane, wherever plantations exist it is hunted without mercy, and driven from the district.

The smaller agouti, rather less than a rabbit, generally inhabits forest districts; and as it is there a nocturnal animal, it spends the chief part of the day in its hiding-place—usually the cleft of a rock or the hollow of a decaying tree—twenty or thirty creatures congregating together. Here their nests are formed of soft leaves, where the young are placed till they are able to accompany their parents on their predatory expeditions. It is a gentle little creature, and when caught, instead of attempting to bite, only gives vent to a piteous cry.

The larger agouti, or mara, is sometimes classed between the agoutis and the pacas. It is more easily tamed than the smaller species, and the fur is handsomer—of black, white, and golden brown.

The Paca (Coelogenys).

The paca—another rodent—is remarkable for its enormously-developed cheek-bone, and for the thick pouch which it possesses. Like its big relation, the capybara, it always takes up its abode in the neighbourhood of water. It forms a burrow so near the surface, that a person walking over it suddenly steps through. It generally makes three openings, which it covers with dry leaves and branches. The Indian easily discovers the entrances, when he closes up two of the apertures, and watches till the paca ventures out of the third. The little animal, however, defends itself bravely, and will severely bite its assailant.

It is of a thick, clumsy form, measuring about two feet in length from the tip of the nose to the extremity of the body, and about one foot in height. The hinder limbs are long, the front ones much bent. Its feet are armed with thick, strong, conical claws, suitable for digging.

Though a clumsy-looking creature, it can run and jump with great activity. It makes a noise somewhat like the grunting of a young pig. It lives upon fruits and tender plants, going out from its hole to forage at night, but generally remaining concealed during the daytime. When alarmed it readily takes to the water, and dives and swims remarkably well.

Bates describes a tame cuatea, or an agouti, which he found feeding in the neighbourhood of a village, nibbling the fallen fruits of the inaja-palm. On his trying to catch it, instead of betaking itself, as he thought it would, to the thicket, it ran on to the house of its owners, which was at a distance of about two hundred yards.

The paca and agouti belong to the peculiar family of the rodent order confined to South America, and which connects the Rodentia to the Pachydermata—the order to which the elephant, horse, and hog belong.

The fossil toxodon resembled the Rodentia in its dentition, and, at the same time, was nearly related to the elephant. These facts make it probable that these animals are living representatives of a group which existed at a distant epoch of the world's history, and which possessed a structure partaking of the character of the two great orders—Rodentia and Pachydermata—now so widely distinct in the majority of forms.

The Armadillo.

In days gone by, huge monsters—their backs covered with bony armour—ten feet and upwards in length, some perhaps of the bulk of the rhinoceros, crawled along the plains of South America. They have become creatures of the past, and their places have been taken by others of a similarly curious formation, of which even the giant armadillo, when compared to them, is a mere pigmy. These creatures abound in all parts of the continent, from Paraguay to Venezuela; but, incased as they are in coats of complete armour, and running so quickly, and so rapidly digging into the earth, they can rarely be overtaken by the hunter.

The armadillo (*Dasypus*) belongs to the order of Edentata. The armour, which covers the whole body, consists of a triangular plate on the top of the head, a large buckler over the shoulders, and a similar one covering the haunches; while between the solid portions a series of transverse bands intervene in such a manner as to allow the creature to move its body in a variety of postures. The tail is likewise covered with a series of calcareous rings. It can, in consequence of this peculiar conformation of its covering, roll itself up, like the hedgehog, into a ball, and thus present a solid surface, impervious to the attacks of birds of prey or small quadrupeds. The part over the shell is covered with short hairs, which appear between the joints of the armour. It has a pointed snout, long ears, thick, short limbs,

and powerful claws. With these claws it burrows with extraordinary rapidity, and can inflict severe wounds.

The common armadillo, or the poyou, is about twenty inches in length, including the tail. As its hearing is very acute, and it never ventures far from its home during the daytime, it easily escapes the attacks of its foes, with the exception of man. It readily takes to the water when pursued, and swims well, but does not enter it by choice. The Indian hunter, however, attacks the creature with a skill it cannot escape.

It is a curious fact that mosquitoes often inhabit the burrows of the armadillo. The Indian, knowing this, as soon as he finds a burrow, puts a short stick down it. If a number of insects come out, he knows there is an animal within. When he finds no mosquitoes, he is sure there is no armadillo. If he is satisfied that the armadillo is at home, he cuts a long, slender stick, and introduces it into the hole, carefully observing the line which it takes, and then sinks a pit in the sand to catch the end of it. This done, he puts it further into the hole, and digs another pit; till he at last comes up with the poor armadillo—which has been making a passage in the sand, till, from its exertions, it has lost all its strength.

The armadillo feeds on all vegetable or animal matter not too hard for its sharp teeth. It is especially useful in devouring the offal or the putrid carcasses of animals which might otherwise affect the air. In spite of this coarse style of feeding, its flesh is esteemed by the natives—who for the sake of it perseveringly hunt the poor creature throughout the country.

The species are distinguished from one another chiefly by the number of bands on the trunk of the body, between the shield on the fore-shoulders, and that on the rump. Baron Cuvier, however, divides the whole genus into five small groups,—distinguishing one from another by the number and form of their teeth and claws.

The great armadillo (*Dasypus gigas*) has enormous claws and unequal toes, with twenty-four broad teeth on both sides of its jaws. It measures, exclusive of the tail, nearly three feet in length.

Darwin describes another, living on very dry soil, the pechy (*Dasypus minutus*), which wanders by day over the open plains, and feeds on beetles, leaves, roots, and even small snakes. So rapidly does it burrow, that scarcely is one seen before its hind-

quarters disappear in the sand. It likewise tries to escape notice by squatting down close to the ground.

The Opossum.

There are numerous species of opossum, most of them marsupial, in the Brazils, where they take the place of the shrews of Europe. They are very destructive to poultry. One of the species is aquatic, and has webbed feet. The terrestrial species are nocturnal. They sleep during the day in the hollows of trees, and come forth at night to prey on birds in their roosting-places. Some live entirely on trees.

The Crab-Eating Opossum.

The crab-eating opossum is a curious creature, about ten inches in length; with a prehensile tail, fifteen inches long, in addition. It has a somewhat pointed nose, and a darkish fur. When born, the young are transferred by the mother to her cradle pouch, where they live for some weeks before they are sufficiently developed to venture abroad.

The creature is formed especially for living among the trees, about which it moves with the activity of a monkey. It advances carefully, always entwining its tail round one branch before venturing on to another.

The crabs and other crustaceans on which it lives—from which circumstance it obtains its name—are found on low marshy soils, in the neighbourhood of which these species exist.

Merian's Opossum.

A still more curious creature is Merian's opossum (*Philander dorsigerus*). It has no true pouch, and the mother, therefore, while her young are in their infancy, carries them on her back. From this circumstance the name of *dorsigerus*, or back-bearing, has been given to it. They cling to her fur with their little hand-like feet, while they twine their tails round hers, which she places over her back in a convenient position for that purpose. Other species of opossums carry their young in the same manner,—some even which are furnished with well-developed pouches.

Yapock Opossum.

The little yapock opossum is a representative of the aquatic species (*Cheironectes yapock*). It is of a fawn-grey tint, with dark black marks. It measures in length about ten inches, with a tail of twelve or fifteen inches. The hind-feet are furnished with a membraneous web, which connects the toes together, and serves as a paddle. The fore-paws possess great grasping powers, and have a hand-like appearance. The ears are small, sharp, and pointed, and the head tapering. It possesses also large cheek-pouches, similar in their use to those of monkeys. It is thus enabled to stow away the creatures it catches on its aquatic excursions, and to keep them there till it returns to the shore to dine. It feeds principally on fish, crustaceans, and aquatic insects. So similar is it in its habits to the otter, that it is frequently described as one, and has been called the Demerara otter; but it is in reality a true opossum.

Bats.

No animal's physiognomy can be more hideous, when seen from the front, than the countenance of the largest South American vampire-bat. Fancy a creature measuring twenty-eight inches in expanse of wing, its large leathery ears standing out from the sides and top of the head, and an erect spur-shaped appendage on the tip of the nose,—the grin, and the glistening black eye, all combining to make up a figure which reminds one of some mocking imp of fable. No wonder that imaginative people have conferred diabolical instincts on so ugly an animal.

Ugly as is the broad leaf-nosed family of bats, it is in reality the least harmless. The little grey *Phyllostoma* is the guilty blood-sucker which visits sleepers and bleeds them in the night. It is of a dark grey colour, striped with white down the back, and having a leaf-like fleshy expansion on the tip of the nose. Although they undoubtedly attack sleeping people, yet they appear to be somewhat partial as to the individuals they select. Bates, when sleeping in a room up the Amazon, long unused, was awoke at midnight by a rushing noise made by vast hosts of bats sweeping round him. The air was alive with them. They had put out the lamp, and when he relighted it the place appeared black with the impish multitudes that were whirling round and round. After he had laid about him well with a stick for a few minutes they disappeared among the tiles; but when all was quiet again, they returned once more and extinguished the light. The next night several got into his hammock, and on waking in the morning he found a wound, evidently caused by one of them, on his hip. There were altogether four species. One of them (the *Dysopes perotis*) has enormously large ears,

and measures two feet from tip to tip of the wings. The natives, however, assured him that it was the phyllostoma which had inflicted the wound, and they asserted that it is the only kind which attacks man. But Mr Bates considers that several kinds of bats have this propensity.

Darwin, when travelling in Chili, noticing that one of the horses was very restive, went to see what was the matter; and fancying that he could distinguish something, put his hands on the beast's withers, and discovered a vampire-bat. In the morning, the place where the wound had been inflicted was easily distinguished by being slightly swollen and bloody.

Waterton describes the mode in which the vampire-bat makes the orifice through which to suck its victim's blood. It does so by pressing gently the point of its sharp projecting teeth, noiselessly circling round, and making them act the part of a centre-bit,—performing the operation so quietly that no pain is felt. He says, however, that at times they commit a good deal of mischief. A young Indian boy suffered greatly by being frequently attacked; and the son of an English gentleman was bitten so severely on the forehead, that the wound bled freely on the following morning. The fowls also suffered so terribly that they died fast; and an unfortunate jackass on whom they had set their fancy was almost killed by inches.

The vampire rises in the air by means of a wide flattened membrane connecting the whole of the limbs and tail, the thumb of the fore-paws and the hind-feet alone being left free. This membrane, though wonderfully delicate, is furnished with minute blood-vessels. It also possesses a system of nerves of the most exquisite power of sensation, which enables it to fly rapidly among the boughs and foliage, avoiding all impediments even in the darkest hours of night. The vampire can run along the ground and climb trees by means of the sharp hooks on the fore-paws. They sleep, however, like ordinary bats, hanging by their hind-feet—being thus able at a moment's notice to take to flight.

Of the other species, some have the fur of a blackish colour, some of a ruddy hue.

When flying, the larger ones wheel heavily round and round, somewhat in the manner of a pigeon, so that they may easily be mistaken for birds. Although they live largely on insects, they also greedily devour fruits; indeed, some species live chiefly on them. Bates opened the stomach of several, and found them to contain a mass of pulp and seeds of fruit,

mingled with a few remains of night insects. On comparing the seeds taken from their stomachs with those of cultivated trees, he found that they were unlike any of them: he concludes, therefore, that they resort to the forest to feed, coming only to human habitations in the morning to sleep, where they find themselves more secure from animals of prey than in their natural abodes in the woods.

Part 3—Chapter XII.

Quadrumana.

Monkeys.

The American monkeys consist of two chief families,—the Cebidae, and the Midas or Marmosets—which are again separated into thirteen genera, consisting of about eighty-six species, greatly diversified among themselves. In America neither Pitheciidae or Lemurs are found: they exclusively inhabit the Old World.

The Cebidae have thirty-six teeth; the Marmosets possess but thirty-two: three of them, however, are pre-molar, as are three of those of the Cebidae, thus distinguishing them both from all the forms of the Old World.

The Marmosets are a low type of apes—their brain being smooth, and they having claws instead of nails; but from their intelligent-looking countenances, and their gentle, playful disposition, they appear to have as much sense as the larger apes.

The American monkeys differ greatly in size and form. The largest—the savage black howler—is nearly two feet and a half in length of trunk; while the beautiful timid marmoset is so small that it may be inclosed in the two hands. Some have tails twice the length of their bodies; the caudal appendages of others appear to have been docked, or are altogether absent. The long tails of some are prehensile, and have a smooth surface, which enables them to employ it as a fifth hand; others are covered with thick bushy hair, and are employed apparently only in balancing the animal. When night comes they roll themselves into a ball, huddled together as close as may be, to keep themselves warm. Sometimes it happens that a few little monkeys have not been alert enough to get into the ball, and

are left shivering outside. They keep up a pitiful howling the whole night through.

One family—the Marmosets—have, as has been remarked, claws instead of nails. Others are covered with short, coarse hair; while others, again, have coats of a long, soft silky texture.

Some sport among the branches, seeking their food in the daytime; others, again, only come forth from the hollows of trees, where they have their beds during the night season—their eyes being formed, like those of owls, incapable of meeting the glare of day.

It is remarkable that the smallest of all—the Hapali pygmaeus, measuring only seven inches in length of body—is among the most widely dispersed, having found its way into Mexico: the only monkey known to have wandered far from the great river-plain.

All the monkeys of the New World are arboreal; as, indeed, are many of the animals which, in other parts of the world, live entirely on the ground. They are mostly furnished with long, prehensile tails. Some have the under part of the extremity perfectly smooth, so as to serve the purpose of a fifth hand, by which the creatures can swing themselves from bough to bough, and hold on securely while their four hands are actively employed. On passing through an Amazonian forest, sometimes the branches of the trees are seen alive with active little creatures swinging backwards and forwards, climbing up the sipos with the agility of seamen on the rigging of a ship, scampering along the boughs, playing all sorts of antics, or engaged in plucking the juicy fruit or hard nuts to be found in ample abundance, even on the tallest monarchs of the woods.

Spider-Monkeys.

Among the most curious of the monkey tribe are the ateles, or spider-monkeys,—called also Cebidae, and, by the natives sapajous, one of the species of the coaita, or quata. As they are seen gambolling among the trees, with their long limbs, and still longer tails, ever actively employed, their resemblance to huge spiders is remarkable. Not that the creature is always in a state of activity, for it will often sit swinging slowly backwards and forwards, or place itself in the oddest of attitudes without moving a limb, as if resting after its exertions, or, in a contemplative mood, watching the proceedings in the world

below. Sometimes a whole colony may thus be seen, when the native huntsman, approaching with his deadly blow-pipe, can without difficulty pick them off one by one, and secure his prey. But let them be alarmed, and away they go through the forest, swinging themselves from bough to bough, at a rate which no other creature, without wings, can exceed.

In the spider-monkeys, the tail, as a prehensile organ, reaches its highest degree of perfection, and they may therefore be considered as the extreme development of the American type of apes. Their tails are endowed with the most wonderful degree of flexibility. They are always in motion—except when the animal is perfectly at rest—coiling and uncoiling themselves, like the trunks of elephants, seeking to grasp, apparently, whatever comes within their reach.

The coaita can apply its tail to all sorts of uses. So delicate is its touch, that one would almost think it possessed the power of sight. Should it discover a nest of eggs or any creature in a crevice too small for its paw to enter, it inserts the end of its tail and hooks out the tit-bit.

The animal is of considerable size, and is covered with coarse black hair—with the exception of the face, parts of which are of a tawny flesh-coloured hue. There are various species, each of which has its peculiar district; and they vary slightly in appearance.

In the neighbourhood of Obydos, the *Ateles paniscus* has its abode; while in the Upper Amazon the white-whiskered coaita (*Ateles marginatus*) takes its place. It is remarkable that animals which apparently have the means of moving without difficulty at a rapid rate in any direction should thus be confined to particular localities.

The Chemeck.

The chemeck appears to have a wider range. It possesses a thumb, slightly projecting, and furnished with a nail—though the thumb cannot be used like that of a human being, as it is incapable of being opposed to the fingers. It is a gentle creature, and capable of considerable cultivation. Although playfully inclined, it is seldom spiteful; while its disposition is very different from that exhibited by the capricious temper of the Old World monkeys. It soon learns to distinguish its friends; and will playfully pretend to attack them, but never does any real harm. It is covered with a long fur, which falls densely over

the body; as is its tail, which at once distinguishes it from its relatives. The ear is somewhat similar to that of man, but has no lower lobe. The nostrils open at the sides, and are separated by a wide piece of cartilage. The habits, however, of the ateles, are so similar, that they require no separate description.

Wandering through the forest with an Indian guide, we reach an igarape or stream, where the lofty branches of the trees do not completely meet overhead, but where the opening is as yet of no great width. Lying concealed, we hear a strange chattering and rustling among the foliage in the distance. Pieces of rotten wood, husks, and nuts come dropping down, and we may see the boughs alive with numberless dark-haired little creatures, their long lithe tails twisting and twirling, their active limbs stretched out in all directions, as they make their way through the forest. We recognise them as a troop of ateles, migrating to some other district, or on some expedition in search of food.

On reaching the boughs above the banks of the stream, they seem somewhat puzzled. Several of the elders of the tribe go to the outer ends of the boughs, and appear to be measuring the distance across. As they have an especial dislike to wetting their hairy skins—although they would undoubtedly swim if no other means could be found of getting to the opposite bank—they have devised a method more suited to their tastes. They leap from bough to bough, till they find one projecting in a line with the trunk or branch of any tree inclining over the water from the opposite side. The larger and stronger members of the tribe now assemble, leaving the younger ones to gambol and frisk about among the boughs, and amuse themselves in juvenile monkey fashion. One monkey—the Hercules probably of the tribe—twisting his tail round the outer end of the branch, now hangs by it with his head downwards, at his full length. Another descends by the body of the first, round which he coils his tail. A third adds another link to the chain: and thus, one by one they increase its length, till the surface of the water is almost reached. The chain now begins to oscillate backwards and forwards towards the opposite bank, each movement increasing the length of the arc, till the lower monkey, with fore-arms outstretched, reaches the stem of the tree on the opposite bank. He grasps it tightly, gradually clambering up, and drawing the line composed of his comrades after him, till the monkey immediately below him is also able to seize the trunk, and assist in dragging up the rest. They thus form an almost horizontal bridge above the water. The rest of the agile tribe, now summoned from their sports, begin to cross; the younger ones, in the exuberance of their spirits, taking the opportunity of

playing all sorts of pranks during their passage over the bodies of their self-sacrificing elders—giving many a sly pinch of the ear, or pull of the hair, for which they well know they cannot at the moment receive punishment. Thus the whole party—the mothers with their infants on their backs, and the other juvenile members—cross in safety, and assemble among the branches to watch the further proceedings.

The great difficulty now appears to be for the individuals composing the bridge to get across without touching the water. Trusting to the muscular power of their tails and limbs, they appear in no way daunted. The monkeys which have hitherto formed the lower links of the chain, still holding on by their tails to their friends, work their way up the trunk and along a branch of equal or greater height than that on the opposite side, to which the long-enduring Hercules has hitherto clung. On their attaining the point selected, he at length unwinds his tail, and swings downwards—with a force which seems sufficient to dislocate the limbs of those holding on above—and now becomes the lowest in the line. The force with which he has descended enables him to swing towards the side which his comrades have reached, and to grasp the trunk, up which he also climbs, till his neighbour can catch hold of it. He follows his example, till all, one after the other, have grasped it: and thus they perform an operation which the most renowned of human athletes would find it difficult to imitate.

A troop will cross a gap in the forest in the same way, rather than venture down from the leafy heights they find it safest to occupy. When compelled to descend to the ground, they scuttle over it in the most awkward manner—their long limbs straggling out, and their tails in vain seeking some object to grasp. On these occasions the spider-monkey turns its hind-feet inwards, and thus walks on the outer sides, while the fore-paws are twisted outward; thus throwing the whole of its weight upon their inner edges. It is when thus seen that the appropriateness of the name given to it is more especially observed. When hard-pressed, however, the knowing little animal, finding no bough round which to coil its tail, rears itself up on its hind-limbs, and balances itself by curling up its tail in the form of the letter S, as high as its head; thus—by altering the centre of gravity—being enabled to get over the ground in a posture such as no other member of its tribe can maintain. It will thus run on towards some friendly stem or low-hanging bough, which it seizes with its lithe and prehensile limb, and joyfully swings itself up in its usual monkey fashion, quickly disappearing amid the foliage.

The ordinary size of the coaita's body is about a foot from the nose to the root of the tail, while the tail itself is rather more than two feet in length.

Macaco Barrigudo.

Seated among the boughs may often be seen, in the forests of the Upper Amazon, a number of large, stout-bodied, fat-paunched monkeys, with long flexible tails, furnished underneath with a naked palm, like the hand, for grasping. Their faces are black and wrinkled, their foreheads low, and eyebrows projecting; their features bearing a wonderful resemblance to those of weather-beaten old negroes. The heads of some are covered with black hair, and others with grey. They are called by the Portuguese *macacos barrigudos*, or big-bellied monkeys. They belong to the species of *Lagothrix*, and are closely allied to the coaitas. They are bulky fellows, and though able, by means of their prehensile tails, to get along at a good rate among the boughs, seldom trouble themselves to move rapidly.

With the exception of the black howler, which will be described anon, they are the largest monkeys in America—their bodies measuring about twenty-eight inches in height. Their flesh being highly esteemed by the natives, they are unceasingly hunted by the Indians. Though their manners are somewhat grave, yet, from their mild and confiding temper similar to that of the coaitas—they are much sought after for pets. They live exclusively on fruits.

The Uakari.

On the western side of the River Yapura, near where it pours its waters into the Amazon—a forest region inundated during the greater part of the year—there lives in small troops, high up among the crowns of the lofty trees,—where it feeds on fruits of various descriptions,—a small, almost tailless monkey, its face glowing with the most vivid scarlet hue. Its body, about eighteen inches in height, exclusive of limbs, is clothed from head to tail with very long, straight, shining, whitish hair. Its head, nearly bald, is sprinkled over with a short crop of thin grey hair; whilst round its ruddy countenance, bushy whiskers, of a sandy colour, meet under the chin. It has reddish-yellow eyes. It belongs to the *Cebidae* family. The Indians call it the white uakari. It inhabits, as far as is known, no other district.

In spite of its want of tail, it is an active little creature, running up and down the larger branches, but seldom leaping from one to the other. The mothers, as is the custom with the other monkey orders, carry their young on their back. They are highly valued as pets; but being of a delicate constitution, seldom live long when transported from their native district.

The native hunter, on wishing to obtain one of these creatures alive, goes forth with his blow-pipe, and arrows tipped with diluted wourali poison. This poison, though producing so deadly an effect on animals, as well as human beings who exist without salt, appears to have little or no effect on salt-consuming Europeans. Salt, indeed, is the great antidote to the poison. The hunter, in consequence, supplies himself with a small quantity of salt. As soon as he has shot a monkey, he follows it through the forest, till, the poison beginning to take effect, it falls exhausted into his arms. He then immediately puts a pinch of salt in its mouth, and in a short time the creature revives, and is led away captive. If old, however, when thus caught, it appears to be discontented in confinement, and, seldom becoming tame, in a short time pines away and dies. When a young one is thus caught, it frequently becomes a playful and interesting pet, and is highly valued by the Brazilians.

Further to the west, an allied species of this monkey is found, clothed with red instead of white hair; while, at a still greater distance, a black-faced and grey-haired species takes the place of the two former.

Alouattes, or Howlers.

The voyager up the Amazon, or one of its numerous tributaries, when his montaria has been moored to the banks, a fire lighted to keep prowling jaguars or pumas at a respectful distance, his hammock hung up in his temporary hut, and he is expecting to enjoy a quiet night's rest, is, ere long, often awoken by the sound of the most fearful howling proceeding from the recesses of the forest. Now it sounds like the dreadful roar of the jaguar as it springs on its prey. Now it changes to the terrible and deep-toned growlings of the wild beast as he is pressed on all sides by his foes, and now it seems like his last dying moan beneath a mortal wound. Nothing can be more dismal or dispiriting than the fearful uproar. Hour after hour it goes on during the night, increasing as the dawn approaches. Now the howls come from one direction, now from another, and in far-off parts of the forest. Yet, terrific as they appear, they are produced by animals not much larger than a full-grown fox. It is

the mycetes, or ursine howler—the largest monkey of South America.

On advancing into the forest in the morning, three or four may be seen seated on the upper branches of a tree—shaggy-haired animals, with long prehensile tails like those of the spider-monkeys—hideous-looking creatures, with pyramidical heads, the upper jaw descending much below the cranium, while the branches of the lower one ascend very high, for the purpose of containing a bony, drum-shaped expansion of the larynx, which gives to its voice that prodigious volume of sound which makes night hideous.

They differ somewhat in colour. Some are entirely black, others brownish-black, while the *Mycetes ursinus* is of a shiny yellow.

These unmusical howlings are supposed by some naturalists to be merely the nocturnal serenades of lover mycetes addressed to their mistresses, seated high on the branches in some distant part of the forest; others regard them rather as noises which serve to intimidate their enemies, though not emitted in general for any sudden alarm.

The female howler carries its young on its back. It is the least attractive in appearance of its western brethren, and is the only one of the monkey tribe which the natives are unable to tame. Though often caught, they do not survive many weeks in captivity. It lives on fruits and nuts, and is hunted for the sake of its flesh, which, though rather dry, is much esteemed. The natives entrap this monkey in a curious fashion. They take a large nut, and scraping out the interior, leave only a small mouth, and, filling it with sugar, leave it near the trees inhabited by the mycetes. The inquisitive monkey soon descends to examine the nut, and putting in his hand, grasps the sweet contents. Knowing that it is well-suited to his taste, he will not let go, but runs off with his prize, which greatly impedes his progress. Although he might easily draw out his hand by opening it, this he does not think of doing; and thus, unable at the best to move rapidly over a level surface, is soon overtaken by the hunter, and captured.

The Cuxio (Bearded Saki).

Among the host of curiously-shaped, long-tailed, active little monkeys which inhabit the American forests, the cuxio is one of the most remarkable. Its general colour is a grizzly-brown; but the head, limbs, and tail, are black. As the passer-by sees the

odd little creature gazing down on him, he might fancy that it had just escaped from the hands of the *perruquier*. The black hair of its head is parted carefully on either side. Its enormous black beard seems as if just freshly dressed; while its bushy tail looks as if equally cared for. Notwithstanding its somewhat fierce and Turk-like visage, it lives a respectable, domestic life, with one partner alone—the sharer of its home—engaged in the task of rearing its infant progeny.

She is not of so dark a colour as her mate, her hair being chiefly of a rusty-brown.

The odd little creature's head is of a round form, and considerable size, greatly increased in appearance by the amount of hair which surrounds it. The nostrils are wide, and divided by an unusually large cartilage. It is furnished with large jaws, and teeth so sharp that it has been seen to drive them, when angry, into a thick plank. When in a rage it grinds them together, and, rubbing its long beard in a most curious way, leaps about in every direction. At the slightest cause of offence, it gives a savage grin, wrinkling the skin of its face and jaws, and threatening the offender with the most menacing grimaces.

It seems perfectly conscious of the unusual adornment of its head, treasuring its bushy beard with as much care and pride as does a human exquisite. When drinking, it dips its paw, curved into the shape of a spoon, into the water, and thus brings the liquid to its mouth. The natives declare that it does so to avoid the risk of wetting its long beard, of which—being generally destitute of such appendages themselves—they fancy it must be excessively vain. As it is chiefly nocturnal in its habits, it might be classed among the *Nyctipithec*i, or night monkeys. From its fierce countenance, long, sharp teeth, and savage temper, it has gained its second scientific name—*Brachyuras Satanus*.

The Cacajao.

The cacajao is a curious contrast to the cuxio. It is called also the black-headed saki. Unlike most of its brethren, it has but a short, hairy tail, looking as if it had been docked. The head is perfectly black, somewhat flattened at the temples, with large ears approaching in shape to those of the human head, and devoid of hair. The fur on the body is generally of a bright yellowish-brown. When full-grown, the animal reaches to upwards of twenty inches in length, while the tail is from three to five inches long. Its legs are covered with rough hair, and its fingers are unusually long and slender, giving it an awkward

appearance when feeding. In captivity it is a docile and peculiarly timid animal. A little creature which had been caught exhibited great alarm at the appearance of several small monkeys of its own country; and when a serpent was placed before its eyes, it trembled violently.

It is found on the borders of the Negro, where it is known by several names—among others, as the *mono faio*, or ugly monkey.

Marmosets, or Midas Monkeys.

The most active, playful, and amusing of animals are the midas monkeys, which form the second family of American *Quadrumania*, several species of which exist, each in its respective district. As they are seen gambolling among the branches,—now running round and round the trunk of a perpendicular tree, now with their sharp claws rapidly mounting the branches, sending down showers of rotten bark and twigs, and uttering sharp twittering cries,—they might be mistaken for a troop of squirrels.

They are restless, inquisitive little creatures, possessed of a large share of curiosity. When a stranger is passing through the forest, they invariably stop for a few moments to have a stare at him.

Though in no way related to squirrels, which belong to the rodent order, they may easily be mistaken for them at a distance. They are all of small size, and very similar, in their mode of climbing, to squirrels. Their nails, also, except those of the hind-thumbs, are long and claw-shaped; and the thumbs of the fore extremities, or hands, are not opposable to the other fingers. Their bodies are long and slender, clothed with soft hair; and their tails, though not prehensile, are nearly twice the length of their bodies.

Midas Ursulus.

The *midas ursulus* is found in the Lower Amazon, frequently in the neighbourhood of towns, and it seems much less afraid of man than most other monkeys. It is seldom that more than three or four individuals are seen together. It moves generally among the larger boughs and trunks of trees, its long nails assisting it to cling securely to the bark.

It lives on both animal and vegetable food; the former including various insects, eggs, and occasionally a young bird—while its vegetable diet consists of all the sweetest fruits it can find. The smaller insects—flies, and other soft-bodied creatures—it pops into its mouth whole; but when eating a larger one—such as a cockroach—it nips off the head, wings, and legs, before putting it into its mouth.

It has gained the name of *oustiti*, in consequence of its giving vent to a little sharp whistle when alarmed or irritated; but it otherwise generally preserves silence.

The *midas ursulus* is about nine inches long; and the tail measures fifteen inches. It is clothed in a thick, long fur, and has a reddish-brown streak down the middle of the back.

It is often seen in the houses at Para, and when treated kindly becomes very tame and familiar. When, however, strangers approach it, its dark, watchful eyes, expressive of distrust, observe every movement which takes place.

Midas Leoninas, or Jacchus Rosalia.

Another species, the *Midas leoninas*, or *Jacchus Rosalia*, inhabits the Upper Amazon. It is only seven inches in length. It is so named on account of the long brown mane which hangs from the neck, and gives it very much the appearance of a diminutive lion.

One of these little creatures, kept tame, became familiar with every one, and used to climb up the chairs, over their shoulders and heads, just as a squirrel does. Mr Bates relates that one he met with, having reached his shoulder, looked into his face, showing his little teeth, and chattering, as though it would say, "Well, and how do you do?" It exhibited more affection towards its master than to strangers, and would climb up to his head a dozen times in an hour, and make great show of searching for certain animalcule.

Audubon the naturalist possessed a little creature of this species, which could distinguish different objects depicted in an engraving. On showing it the portrait of a cat and a wasp, it became much terrified; but when the figure of a grasshopper or beetle was placed before it, it precipitated itself on the picture, as if to seize them.

Another, which belonged to a lady, used, when angry, to pull at her hair, and nibble the ends of her ringlets. It also possessed the accomplishment of being able to stand on its head.

It is certainly one of the most beautiful of its tribe. It is covered with long glossy locks of a bright and lustrous chestnut, having a golden sheen, almost varying in texture with the fine fibres of unwoven silk. The colour darkens somewhat on the paws. The fur is everywhere long, but on the head and shoulders it is of extraordinary length in proportion to the size of the animal, which has thus gained a name very inappropriate to its disposition, as it is an especially timid little creature, and unable to do battle with any foe. It is, however, so active and clever in hiding itself, that it is enabled to escape from its enemies. When pleased, its voice is soft and gentle; but when angry or terrified, it utters a somewhat sharp hiss.

Midas Argentatus.

Among the rarest of the tribe is the *Midas argentatus*, measuring only seven inches in length of body. It resembles a little white kitten,—being covered with long white silky hair. The tail, however, is blackish, and the face nearly naked and flesh-coloured. The eyes, which are black, are full of curiosity and mistrust; and one seen in captivity—except when in the arms of its owner—shrank back and trembled with fear, while its teeth chattered, and it uttered a tremulous, frightened tone, at the approach of a stranger.

Sai Capicinus.

The most attractive little creatures in the American forests are the capucins, the best-known of which is the *Sai capicinus*. Their tails, though covered with hair, are prehensile. They are active and lively in the extreme, leaping about from bough to bough, and eagerly watching all that goes forward in the world below. There are several species of similar habits, their quaint ways and general intelligence making them all great favourites when tamed. They live chiefly on vegetable food, but they devour insects and eggs, and do not object to a bird when they can manage to catch one.

Horned Capucin.

The horned capucin, or sapajou (*Cebus fatuellus*), is remarkable for two points of hair which stand out from the forehead, and give it the appearance of having horns. The colour is sometimes

of a deep brown, and at others of a purple-black, while occasionally it has a chestnut tint.

The Common Capucin.

The hair of the common capucin is of a golden olive, with white fur bordering the face.

These curious little creatures are noted for forming a friendship with other animals when in captivity. Baron Humboldt mentions one which used to mount on the back of a pig every morning, and continued sitting there during the whole of the day; and even when the pig went out feeding on the campos, it still kept its seat, riding back again in the evening to its home. Others have been known to choose cats for their steeds, and perseveringly to keep their hold in spite of their active movements—seeming to enjoy them as much as the llanero does those of a colt he is engaged in breaking-in.

Parauacu.

On the dry lands to the north of the Upper Amazon, a little timid inoffensive monkey is found with a long bear-like coat of speckled grey hair. The long fur hangs over its head, half concealing a pleasing diminutive face; the tail—to the very tip—which is of some length, is also completely covered.

Pithecia Hirsuta—Pithecia Albicans.

There are two more species—the *Pithecia hirsute* and the *Pithecia albicans*. They are especially capable of attachment to those who treat them kindly. Being somewhat dull and cheerless, they seldom indulge in the usual sportive movements of their race.

Mr Bates relates that a friend of his possessed one of these little creatures. His friend, accompanied by the monkey, was in the habit of paying him a daily visit. One day the little animal, having missed its master, concluded, as it seemed, that he had gone to his house, and accordingly came straight to it, taking a short cut over gardens, trees, and thickets. This it had never done before; they learned it, however, from a neighbour who had observed its movements. On arriving at Mr Bates's house and not observing its master, it climbed to the top of the table, and sat with an air of quiet resignation waiting for him. Shortly afterwards he arrived, and the gladdened pet then jumped to its usual perch on his shoulder.

Saimibi—Callithrix—Teetee—Collared Teetee.

There is another genus of light and graceful little monkeys, known by the name of *Callithrix*, or “beautiful hair.” Among them is the *Saimiri*, or teetee, of which there are several species. The collared teetee is among the most attractive—*Callithrix torquatus*. The general colour is a greyish-olive, the limbs looking as if washed with a rich golden hue. The ears are white, and the body whitish-grey. The tip of the long tail is black.

They are very engaging little creatures, and possess an intelligence which makes them the most attractive of their race. Their temper, too, is amiable, and they are never known to get into a passion. Their countenances express almost an infantine innocence, and this exhibits itself especially when the creatures are alarmed. Tears fill their hazel eyes; and, with imploring gestures, they seem to claim the protection of their human friends. They have also a curious habit of watching the lips of those who address them, as if they could understand what is spoken; and apparently wishing the better to comprehend their master, they will place their fingers on his lips in the most attractive, confiding way.

The creature’s long tail possesses no prehensile power, but it appears to use it as a lady does a boa,—coiling it round its body to keep itself warm.

Night Apes, or Douroucoulis.

When travelling through some parts of the Amazonian forests, and looking up into an ancient tree, a number of little striped faces crowding a hole in the trunk may suddenly be seen gazing inquisitively down at the intruder who has disturbed their noonday sleep. These are *Nyctipithecis*, or night apes, which the Indians call *ei-a*, and are named also Douroucoulis. Sleeping soundly during the day in some dark hollow, out of harm’s way, they come forth at night to prey on insects or small birds, which they hunt and capture,—as well as fruit. The body of the creature is about a foot long, and the tail fourteen inches, thickly covered with soft grey and brown fur. Its face is round, and encircled by a ruff of whitish fur. The forehead is of a light colour, and adorned with three black stripes,—which in one species meet at the top of it, and in another continue to the crown; the muzzle is somewhat flat, and the mouth and chin small. The ears are very short, scarcely appearing above the hair of the head; and the eyes are large and of a yellowish

colour, imparting that staring expression observed in owls or night animals. From this they have obtained the name of owl-faced night apes. The creature has nails of the ordinary form to its fingers, and semi-opposable thumbs; but the molar teeth are studded with sharp points, showing that it lives chiefly on insects.

Though in the daytime it appears torpid and dull, yet at night, shaking off its drowsiness, its large dull eyes, which shrunk from the rays of the sun, are full of eager animation as it sets off in quest of its prey. So active and quicksighted is it, that it catches the rapidly-flying insects as they flit by, or chases the beetles as they run over the bark of the trees on which it lives.

Mr Bates describes a tame one he met with, which was excessively confiding in its disposition, very lively and nimble, and in no way mischievous. It delighted to be caressed by all persons who came into the house. It used to sleep in the hammock of its owner, or nestle in his bosom half the day as he lay reading. From the cleanliness of its habits, and the prettiness of its features and ways, it was a great favourite with every one. He himself had a similar pet, which was kept in a box, in which was placed a broad-mouthed glass jar. Into this it would dive when any one entered the room, and, turning round, thrust forth its inquisitive face to stare at the intruder. It was very active at night, giving vent at intervals to a hoarse cry, like the suppressed bark of a dog, and scampering about the room after cockroaches and spiders. Although it preferred insects, it ate all kinds of fruit, but would not touch either raw or cooked meat. Its brothers, when let loose about the house, are very useful in clearing the chambers of bats, as well as insects and vermin.

It is monogamous. The ei-a and its wife may often be discovered together tending their small family in some hollow trunk. Its cry is wonderfully loud, considering its small size; and curious as it may seem, is not unlike the roar of the jaguar. It can also hiss or spit in the fashion of an angry cat, while it utters a curious mew resembling the same creature. It sometimes gives a guttural, short, and rapidly-repeated bark.

There are several species of night monkeys with very similar habits.

It is difficult, except when they are in captivity, to obtain a correct idea of the habits of these interesting little animals,—though, of course, when they are tamed, they must abandon some of those they possessed in a state of nature. Of their

dispositions, however, a very fair notion may be formed from the way they behave when in captivity. The above descriptions refer only to a few of the numerous species of monkeys which exist in the South American forests, but as typical forms have been selected, a tolerable idea of the whole may be obtained.

Part 3—Chapter XIII.

Birds.

Humming-Birds.

Most of the humming-birds found on the banks of the Amazon belong to the genus *Phaethornis*; remarkable for their long, graduated tails, the central feathers of which greatly exceed the others. Their nests are curious and beautiful, being formed in a long funnel-like shape, tapering below to a slender point. They are woven with great delicacy, and attached to some twig, or hanging leaf, by means of spider's webs. They are lined with a soft silky cotton fibre; and composed, externally, of a woolly kind of furze, bound together with which appears also to be spider's web.

One of the largest is the *Eupetomena macroura*, with a swallow tail, and a livery of brilliant emerald-green and steel blue. When feeding, it remains a shorter time than usual poised in the air before the flowers, frequently perching, and occasionally darting after small insects flying by.

When the orange-trees become fully covered with flowers, the humming-birds appear in vast numbers. Their motions are totally unlike those of other birds. So quickly do they dart backwards and forwards, that the eye can hardly follow them. Even when poising themselves before a flower, with such inconceivable rapidity do their wings move, that even then their bright colours are scarcely perceptible; and anon they shoot off to sip the nectar from another cup. Unlike the systematic way in which bees proceed, they seem to delight in darting, now in one direction, now in the other; now for a moment they perch on a spray, probing, as they sit, the flowers nearest to them; then again they fly off, in their eccentric course, to another spot.

"Wherever a creeping vine opens its fragrant cluster, or wherever a flower blooms, may these little things be seen," writes Edwards, in his usual graphic way; "in the garden, or in

the woods, over the water, everywhere, they are darting about, of all sizes, from one that might easily be mistaken for a different variety of bird, to the tiny hermit—*T. Rufigaster*, whose body is not half the size of the bee's—buzzing about. Sometimes they are seen chasing each other, in sport, with a rapidity of flight and intricacy of path the eye is puzzled to follow. Again, circling round and round, they rise high in mid-air, and then dart off like light to some distant attraction. Perched upon a little twig, they smooth their plumes, and seem to delight in their dazzling hues; then, starting off leisurely, they skim along, stopping capriciously to kiss the coquetting flowerets. Often two meet in mid-air and furiously fight, their crests, and the feathers upon their throats, all erected and blazing, and altogether pictures of the most violent rage. Several times we saw them battling with large black bees who frequent the same flowers, and may be seen often to interfere provokingly. Like lightning our little heroes would come down, but the coat of shining mail would ward off their furious strokes. Again and again would they renew the attack, until their anger had expended itself by its own fury, or until the apathetic bee, once roused, had put forth powers which drove the invaders from the field."

Bates remarks, that he several times shot, by mistake, a humming-bird hawk-moth, instead of a bird. This moth (*Macroglossa Titan*) is smaller than humming-birds generally are, but its manner of flight, and the way it poises itself before the flower whilst probing it with its proboscis, are precisely like the same actions of humming-birds. This resemblance has attracted the notice of the natives, who firmly believe that one is transmutable into the other. The resemblance between this hawk-moth and the humming-bird is certainly very curious, and strikes one, even when both are examined in the hand. Holding them sideways, the shape of the head and position of the eyes in the moth are seen to be nearly the same as in the bird, the extended proboscis representing the long beak. At the tip of the moth's body there is a brush of long hair-scales, resembling feathers, which, being expanded, looks very much like a bird's tail; but, of course, all these points of resemblance are merely superficial.

He one day saw a little pigmy, belonging to the genus *Phaethornis*, in the act of washing itself in a brook. It was perched on a thin branch, whose end was under water. It dipped itself, then fluttered its wings, and plumed its feathers, and seemed thoroughly to enjoy itself alone in the shady nook which it had chosen. "There is no need for poets to invent," he

adds, "while nature furnishes us with such marvellous little sprites ready to hand."

But these beautiful little creatures require a separate description.

Topaz Humming-Bird.

The topaz humming-bird is perhaps the most resplendent and beautiful of its tribe. The fiery topaz (*Topaza pyra*) is found on the shores of the Rio Negro. The larger part of its feathers are of a blazing scarlet, which contrasts beautifully with the deep velvet-black of the head and part of the neck. The throat is emerald-green, with a patch of crimson in the centre. The lower part of the back, and the upper tail-coverts, are of a resplendent green with an orange gloss; and the wings and tail of purple-black, the two elongated feathers of the tail excepted—they being of a purplish-green. Its nest appears as if formed of leather, and is so cleverly woven that it can scarcely be distinguished from the bark or fungi growing on the branch to which it is fixed.

Ara Humming-Bird.

The crimson topaz, or ara humming-bird (*Topaza pella*), vies with it in beauty. Its hues are of a deeper crimson. The tail is of a reddish-buff, except the two central feathers, which are of the same hue as the preceding. Unlike most humming-birds, it is of a shy and retiring disposition, and seldom ventures from among the deep shades of the forest; and then only at early dawn, or late in the evening, when it may be seen darting across the stream in search of insects, on which it chiefly feeds.

The Racket-Tail Humming-Bird.

The racket-tail humming-bird (*Discúra longicauda*) takes its name from the curious form of its tail, the feathers of which are forked,—the two exterior ones being twice the length of the second pair. The colour of the tail is purple-black; the face, throat, and part of the neck light green; while under the chin there is a little velvet-black spot. The upper part of the body is a bronze-green, and a bright buff band crosses the lower end of the back.

The Cayenne Fairy.

The beautiful little Cayenne fairy (*Heliothrix auritus*) is often seen flitting among the flowers which adorn the trees near the mouth of the Amazon. It may be known by the snowy-white under part of its body, while the upper surface is of a glossy golden green, extremely light on the forehead. The middle feathers of the tail are blue-black, and the three exterior ones are white. Across each side of the face is a jet-black line, terminated by a small tuft of violet-blue, while below the black line runs a luminous green one. Few of these beautiful little creatures have any voice which rises above a mere twitter.

The best songster of the tribe is the Vervain humming-bird, found in the West India Islands. Those on the Amazon are almost mute. Small as they are, they are brave little creatures, and several of the species are tamed without difficulty.

Mr Webber describes one of the means by which nature has gifted these little creatures of escaping the observation of their foes. On leaving the spot where a number had perched not far from their nests, he observed them shoot suddenly and perpendicularly into the air till they had got out of sight. After a time, down came the hen-bird, like a fiery aerolite from the sky, upon the very spot where she had built her nest, so rapidly, as almost to escape observation.

Different species, of great varieties of form and colour, are found throughout the continent. Although the greater number are confined to particular localities, others have a wide range.

The *Trochilus forficatus* is found over a space of 2500 miles on the west coast, from the hot, dry country of Lima to the forests of Tierra del Fuego, where it may be seen flitting about in snow-storms; as also in the humid climate of the wooded island of Chiloe, where Darwin found it skimming from side to side amidst the drooping foliage. On the mountain heights, in the thick forests and open plains, wherever flowers and insects exist, there one or more species make their home throughout the continent.

Cotingas.

Lovely as are the humming-birds, the cotingas, belonging to the order of Passeres, and of which there are several species, almost rival them in beauty of plumage. The crown of one is of a flaming red, abruptly succeeded by a shining brown reaching half-way down the back. The remainder of the back, rump, and tail, the extremity of which is edged with black, is of a lively

red. The belly is of a somewhat lighter red, the breast reddish-black, the wings brown.

This cotinga is a solitary bird, and utters only a monotonous whistle, which sounds like *quet*. Another has a purple breast with black wings, and tail and every other part of a light and glossy blue.

The pompadour cotinga has a purple body and white wings, their four first feathers tipped with brown.

None of these have any song. The last, however, utters sounds something like *wallababa*. They feed on the fig, wild guaco, and other fruit-trees.

The Campanero, or Bell-Bird.

Far-away in the forest a singularly loud and clear note, like the sound of a bell, is heard; mile after mile, and still the same strange note reaches the ear. A single toll; then a pause for a minute, then a pause again, then a toll, and again a pause; then for six or eight minutes no toll is heard; then another comes strangely and solemnly amid the tall columns and, fretted arches of the sylvan temple. Sometimes of a morning, and sometimes in the evening, and even when the meridian sun has silenced all the other songsters of the grove, that strange toll is heard. At length, high up on the dried top of an aged maura, a snow-white bird may be seen, no larger than a pigeon; and yet it is the creature who is uttering those strange sounds. It is another species of the cotinga—the well-known campanero, or bell-bird. On its forehead rises a spiral tube nearly three inches long, which is of jet-black, dotted all over with small white feathers. Having a communication with the palate, it enables the bird to utter these loud clear sounds. When thus employed, and filled with air, it looks like a spire; when empty, it becomes pendulous. Though, like most of its tribe, it is sometimes seen in flocks, it never feeds with other species of cotingas.

The witty Sydney Smith, remarking on the account Waterton gives of the campanero, observes: "This single bird then has a voice of more power than the belfry of a cathedral ringing for a new dean. It is impossible to contradict a gentleman who has been in the forests of Cayenne; but we are determined, as soon as a campanero is brought to England, to make him toll in a public place, and have the distance measured."

Had the witty dean been aware of the fact—stated by the astronomer and aeronaut, Mr Glaisher—that a female voice is heard a mile further than that of the most hirsute and sturdy “tar,” he might have been less sceptical of the powers of the little cotinga to make itself heard for the distance of three miles through the pure and calm air of the tropics.

The Umbrella, or Fife-Bird.

In the yearly submerged gapo forests and the plains of the Upper Amazon, a singularly deep and long-sustained flute-like sound is often heard. It might be supposed that it was produced by the pan-pipes used by the natives of that region. It is, however, the note of a bird, named by the Indians *uira mimbeu*, or fife-bird, from the peculiar tone of its voice. It is, from the ornament on its head—consisting of a crest, with long curved hairy feathers, having long bare quills; which, when raised, spread themselves out in the form of a fringed sunshade over the head—called the umbrella-bird (*Cephalopterus ornatus*). It resembles in size and colour the common crow. In addition to this umbrella-like ornament on its head, it has what may be called a pelerine suspended from the neck, formed by a thick fan of glossy steel-blue feathers which grow on a long fleshy lobe or excrescence. This lobe is connected with an unusual development of the trachea and vocal organs, undoubtedly assisting the bird to utter its strange note. While singing, it draws itself up on the bough, spreads widely out the umbrella-formed crest, waves its glossy breast lappet, and then, in giving vent to its loud, piping note, bows its head slowly forward.

The female has only the rudiments of a crest and lappet, and is of a much duller colour than the male.

The Cock of the Rocks.

Among the forest highlands at the foot of the sierras to the north of the Amazon, the magnificent orange-coloured cock of the rocks enjoys existence. About the size of a pigeon, it belongs to the tribe of the diminutive manakins, most of which have beautiful and curious plumage. It, however, surpasses them all.

It has gained its name from the slight external resemblance that it bears to the gallinaceous form.

Its plumage is of a rich orange tint; with the exception of the quill-feathers of the wings, which are of a sooty black hue, and

those of the tail, which are brown tipped with yellow. On its head it wears a peculiar fan-like crest, which, overhanging the forehead, extends to the back of the head, and which bears a strong resemblance to the plume of an ancient helmet. The tips of these crest-feathers are tinged with brown and yellow. Between the wing and upper tail-coverts appear flowing plumes, which droop gracefully over the firmer feathers of the tail and sides.

Like some birds of paradise in the Eastern Archipelago, the cocks of the rocks assemble in numbers to perform a kind of dance for their amusement, selecting generally the smooth rocks or roots of trees,—moving here and there, round and round, backwards and forwards, and erecting their gorgeous plumes, to exhibit their beauty. Wallace observed a company of birds engaged in this singular way, though he says that no females or young birds were present.

Schombergh describes a similar scene. A troop of these beautiful birds was celebrating its dances on the smooth surface of a rock. About a score of them were seated on the branches as spectators, while one of the male birds, with proud self-confidence, and with spreading tail and wings, was dancing on the rock. He scratched the ground, or leaped vertically in the air; continuing these saltatory movements until he was tired, when another male took his place. The females, meanwhile, looked on attentively, and applauded the performances of the dancers with laudatory cries.

Wallace, in his later work on the Eastern Archipelago, gives an equally animated picture of the king birds of paradise enjoying a similar performance on the topmost boughs of the most lofty trees in the Aru Islands.

Golden-Winged Manakin.

The golden-winged manakin—another tribe—are often seen perched in large flocks on the summits of the trees, or rapidly moving amid the branches in search of the rich fruits and numerous insects found in the gapo forests.

The beautiful little troupiale, arrayed in plumage of rich orange and shining black, with delicate and well-shaped form, pours forth a variety of sweet and plaintive notes among the dry forest lands, and has gained from the Portuguese the name of the nightingale of America.

There is another of a smaller size, and of less rich a colour, which also sings melodiously. It is a fearless bird, and the hen builds her nest often in the roofs of cottages, while her mate sings for hours close by. There are several species, one of which (the *oriolus varius*) builds a curious nest like a basket, of a conical form, and of a loose texture; securing it to the flexible end of a branch, thus enabling it the better to endure the movement to which it is subjected when agitated by the wind.

A fourth species flies in flocks—especially when the Indian maize is ripe—and is looked on with a jealous eye by the farmers, whom it robs, and whom it does not repay by the melody of its song.

Goatsuckers.

Numerous species of the goatsucker, well known as the bird of night, inhabit the forests of the Amazon as well as the settled districts. Their pretty mottled plumage is destitute of the lustre which is observed in the feathers of the birds of day. One is nearly the size of the common wood owl. Its cry once heard will never be forgotten. It seems like one in deep distress. "A stranger," says Waterton, "would never believe the sound to be the voice of a bird. He would say it was the last groan of a midnight murdered victim, or the cry of Niobe for her children before she was turned into stone. Suppose a person in great sorrow, who begins with a loud note, Ha, ha, ha, ha! and so on, each note lower and lower, till the last is scarcely heard, pausing a moment or two between every note, and some idea may be formed of the moaning of the largest goatsucker."

Other species articulate some words so clearly, that they receive their names from the sentences they utter. One cries "Who are you? who, who, who are you?" Another bids you "Work away; work, work away." A third shrieks mournfully—"Willy come, go Willy, Willy, Willy come, go;" and a fourth exclaims—"Whip poor Willy; whip, whip, whip poor Willy!" Happily for it, neither the negro nor the Indian—who believe it to be a bird of ill-omen—will venture to kill it; supposing the bird to be the receptacle for departed souls, come back to earth, unable to rest for crimes done in their days of nature.

Ignorance alone has given the goatsucker its name. When the moon shines bright, it may be seen close by the cows, goats, and sheep, jumping up every now and then under their bellies. "Approach a little nearer," says Waterton; "he is not shy, he fears no danger, for he knows no sin. See how the nocturnal

flies are tormenting the herd, and with what dexterity he springs up and catches them as fast as they alight on the bellies, legs, or udders of the animals! Observe how quiet they stand, and how sensible they seem of his good offices; for they neither strike at him, hit him with their tails, tread on him, nor try to drive him away as an uncivil intruder. Were you to dissect him, and inspect his stomach, you would find no milk there. It is full of the flies which have been annoying the herd."

Caciques.

A species of cacique—of which there are several—like the blue jay of the northern part of the continent, is celebrated for its imitative powers. It is one of the handsomest in form of the feathered tribe, in size somewhat larger than a starling. On each wing it has a yellow spot; and its rump, belly, and half the tail are of the same colour. All the rest of the body is black; while the beak is of the colour of sulphur.

It lives on the fruits and seeds which nature has provided in the forest; but wherever human habitations are found, it delights to take *up* its station on a tree close by, and there, for hours together, pour forth a succession of imitative notes. Its own song is sweet, but very short. If a toucan is yelping in the neighbourhood, it drops its own note and imitates the huge-beaked bird. Then it will amuse itself with the cries of different species of woodpeckers; and when the sheep bleat, it will distinctly answer them. Then comes its own song again; and if a puppy-dog or a Guinea-fowl interrupt it, it takes them off admirably,—and by its different gestures during the time, it might be supposed that it enjoys the sport.

The cacique is gregarious, and is generally found in large flocks,—sometimes one species building their nests on one side of a tree, while another, with a neighbourly feeling, appears to have selected the opposite side; and they may be seen working amicably away, without interfering with each other. They show wonderful instinct in the selection of trees, sometimes hanging their large pendulous nests to the extremities of palm branches, that they may thus be as much as possible out of the reach of enemies who might attempt to take their young brood. Others are said to select the trees on which the stinging-wasps have already built their nests, as no tiger-cat nor reptile of any description would venture to attack such adversaries.

One species (the *casicus cristatus*) weaves its nest of lichens, bark fibres, and the filaments of the *tillandsias*; another (the

casicus rubra) of dry grasses, and always suspends it over the water. This has a slanting opening in the side, so that no rain can penetrate it.

Toucans.

During the dry season, on the topmost boughs of the lofty trees growing on the gapo lands, large gaily-coloured birds, with huge beaks of the shape of a banana or pacova, are perched, in bands of five or six, uttering loud, shrill, and yelping cries, having somewhat the resemblance to "Tocano! tocano! tocano!" Hence the Indians give them the name from which we derive *toucan*—a bird especially characteristic of the forests of Tropical America. The Brazilians also call them "preacher-birds,"—from their habit of lifting up their beaks, and clattering them together, and shouting hoarsely. One, mounted higher than the rest, acts either as the leader of the inharmonious chorus, or does the duty of sentinel. He keeps a bright look-out on every side, and as danger approaches, gives a warning cry, when his companions stretch their necks downwards in an inquisitive manner, to ascertain what foe is below; and on espying the least movement among the foliage, fly off to a distance.

Sometimes the whole flock, including the sentinel, set up simultaneously a deafening loud yell, which can be heard a mile off, and serves to lead the hunter to their haunts. They are said also to mob any strange bird which gets among them, surrounding it, and shrieking at it in whichever way it turns; so that it sees itself surrounded on all sides by huge snapping bills, and long tails bobbing regularly up and down with threatening gestures, till it is seized by its foes or manages to make its escape.

It seems wonderful at first sight that any creature should be encumbered with so huge a beak; but the toucan knows well how to use it. Though of great size, it is of light structure, and serrated at the edges. In some species it attains to a length of seven inches, and a width of more than two inches. It assists the bird in climbing the branches of the trees on which he lives, and from which he never willingly descends to the ground. It enables him to seize the large fruits and small birds which serve him for food; and enables him to chew the cud—his huge tooth-bill being useful in holding and re-masticating the food.

As the flowers and fruits which crown the large trees of the forest grow principally towards the end of slender twigs, which would not bear his weight; and as he has a heavy body, with

feeble organs of flight, he cannot seize his food on the wing. He therefore sits on some opposite branch, eyeing the fruit which he thinks will suit his taste, and then darting off, seizes a mouthful, and returns to his perch.

Though their general diet is fruit, they also devour small birds and their eggs, as well, probably, as caterpillars, and the larvae of insects in general. Mr Broderip describes the curious way in which he saw a toucan seize a small bird, pluck off the feathers, and having broken the bones of the wings and legs with his beak, continue working away till he had reduced it to a shapeless mass. He then hopped from perch to perch, uttering a peculiar hollow, chattering noise, and began pulling off piece after piece, till he had swallowed the whole, not even leaving the beak and logs. In a quarter of an hour he had finished, when he cleansed his bill from the feathers. After a time he returned his food into his crop, and after masticating the morsel for a while in his bill, again swallowed it.

The bird mentioned was in captivity; and though his food consisted of bread, boiled vegetables, and eggs, he showed a decided preference for animal food when given to him.

The toucan (*Ramphastos*) belongs to the genus of scansorial birds. There are several species, five of which inhabit the forests of the Upper Amazon. The largest of that region is Cuvier's toucan, and is distinguished from its nearest relatives by the feathers at the bottom of the back being of a saffron hue instead of red. It lays its eggs in hollows of trees, at a great height from the ground, and moults between March and June.

Solitary toucans are sometimes met with, hopping silently up and down the larger boughs, and peering into the crevices of tree trunks. When the gapo is flooded, they fly to the drier ground, assembling in large flocks, when they are easily shot by the hunters. The birds are then very fat, and their flesh sweet and tender.

In some species the bill is nearly as large and as long as the body itself. It is light, cellular, and irregularly notched at the edge, having both mandibles arched towards the tip. The tongue is also of a singular form, being narrow and elongated, and literally barbed like a feather. The feet are short—formed, like those of parrots, rather for grasping than for climbing; the tail long, and the wings moderate. It has a straight but laborious flight, and seems awkward, except on the boughs, when it moves lightly and actively from branch to branch. When eating, it throws up its head, apparently to allow the food to fall

down its throat with greater ease. When the toucan is at roost, it turns its long tail directly over its back, and thrusts its beak beneath the wing, so as to appear very much like a large mass of feathers.

The common or crested toucan (*Ramphastos dicolorus*) inhabits chiefly the lower part of the Amazon. It is about eighteen inches in length, of a black colour, with a gloss of green. The cheeks, throat, and fore part of the breast are either of a sulphur or orange-yellow. Across the lower part of the breast is a broad crimson bar. The rump is crimson or orange-yellow. The bill is of a dark olive-green, with a pale yellow base, bounded by a thick bar.

The tocano pacova has a beak of a rich glowing orange, with a large patch near the tip, a black line round the base, and a number of dark red bars upon the sides. The body and head are black, the throat and cheeks white; while the breast is of a yellow brimstone hue, edged with a line of blood-red. The upper tail-coverts are greyish-white, and the under deep crimson. A large orange circle surrounds the eye, and within it is a second circle of cobalt-blue. A green ring incloses the pupil, with a narrow yellow ring round it.

Cuvier's toucan inhabits the woods of the Upper Amazon. There are several smaller toucans, one of which (the *Pteroglossus Havirostris*) has the most beautiful plumage,—its breast being adorned with broad belts of rich crimson and black.

The most curious, however, is the curly-crested toucan (*Pteroglossus Beauharnaisii*). The feathers on its head consist of thin, horny blades of a lustrous black colour, curled up at the ends, and resembling shavings of steel. The curly crest assumes, indeed, the grotesque form of a coachman's wig dyed black, and produced apparently by the tongs of the hair-dresser.

None of the smaller species utter the loud yelping notes of the larger. The cries of the curly-crested toucan are very singular, resembling somewhat the croaking of frogs.

Mr Bates had one day wounded one; and on attempting to seize it, it set up a loud scream. In an instant, as if by magic, the wood seemed alive with its companions, who descended towards him, hopping from bough to bough, some of them swinging on the loops of the lianas and sipos, croaking and fluttering their wings like so many furies. Had he had a long stick in his hand, he could have knocked over several of them.

The screaming of their companion which he had killed having ceased, they remounted the trees; and before he could reload his gun, which he had left at a little distance, they had all disappeared.

He possessed a tame toucan of one of the large species, which was allowed to go free about the house. Having chastised it for mounting his work-table, the first time it made the attempt, it never again repeated it. It slept on the top of a box in a corner of the room, with its long tail laid right over its back, and its beak thrust underneath its wing. It ate of everything—beef, turtle, fish, farina, fruit—and was a constant attendant at meals. It learned the hour to a nicety, and he found it difficult to keep the bird away from the dining-room at these hours. When it had become somewhat impudent and troublesome, he tried to shut it out in the back-yard; but Tocano used to climb the fence, and hop round by a long circuit, making its appearance with the greatest punctuality as the meal was placed on the table. One day it was stolen, and given up for lost; but two days afterwards it stepped through the doorway at the dinner-hour, with its old gait and sly magpie-like expression, having escaped from the house of the person who had stolen it, situated at the further end of the village.

The Realejo, or Organ-Bird.

(*Cyphorhinus Cantans*; called also the flute-bird.)

While the strange, harsh voice of the goatsucker is hushed, the mycetes has ceased to howl, and no roar of jaguar is heard, a few slow, sweet, and mellow notes reach the ear, following one another like the commencement of an air. The unimpressible natives stop their paddles as they are floating up an igarape to listen to the dulcet strains. The sounds appear to be those of a human voice; some young girl gathering fruit in the neighbouring thicket, it would seem, warbling a few notes to cheer herself in her solitude. Now the tones become more flute-like and plaintive,—now they seem to be those of a flageolet. It is difficult to imagine that they can be produced by a bird. No bird, indeed, can be seen, however closely the surrounding trees and bushes are scanned. Yet that sweet voice seems to come from a thicket close at hand. The listeners are silent, expecting to hear the strain completed, but disappointment follows. An abrupt pause occurs, and then the song breaks down, finishing with a number of clicking, unmusical sounds, like a piping barrel-organ out of wind and out of tune.

This is the organ-bird—the most remarkable songster by far (says Bates) of the Amazonian forests. When discovered, he seems habited in sober colours; but he need not envy his gaily-dressed companions—while, as a songster, he remains unrivalled in his native woods.

The Curassow.

High up among the lofty boughs of the thick forest sit a flock of magnificent birds, each the size of a turkey. They are the crested curassow (*Crax elector*). The plumage is of a deep, shining black colour, reflecting purple and green shades. The abdomen and tail-coverts are white, but the tail is black, and generally tipped with white. On its head it carries a handsome golden crest, the feathers narrow at the base and broad at the tip, which it raises and depresses as it moves along. Its voice, far from sweet, sounds like a hoarse cough, and each time it utters its cry it partially spreads its feathers and throws up its tail. The hen, however, has another way of expressing herself, uttering a whining sound.

Among the trees where they are perched are their large nests, roughly formed of sticks and leaves and plaits of grass. Their eggs, of which there are six or seven, are about the size of those of a turkey, and of a pure white. They feed on bananas and other fruits, as well as maize and rice.

There are several species. One (the *mitu tuberosa*) has an orange-coloured beak, surmounted by a bean-shaped excrescence of the same hue. It lays two rough-shelled white eggs.

Another species (the *crax globicera*) inhabits the Upper Amazon, and possesses a round instead of a bean-shaped excrescence on the beak.

These birds are easily tamed. Bates mentions one which used to attend the family with whom he lived at all the meals, passing from one person to another round the mat to be fed, and rubbing the sides of its head in a coaxing way against their cheeks or shoulders. At night it went to roost in a sleeping-room—beside the hammock of one of the little girls, to whom it seemed to be greatly attached, following her wherever she went about the grounds. These birds, however, do not breed in captivity, and are therefore only kept by the Indians as pets; though possibly they might be induced, by proper management,

to do so, when they would prove a valuable addition to the poultry-yard in England.

In its wild state it seldom descends from the lofty trees.

Macaws.

On observing the curious, powerful beak of a macaw, we at once see that it must be an inhabitant of a region producing hard fruits, which require the application of considerable strength to break them. At morning and evening flocks of this large and richly-plumaged bird may be observed flying across the streams in all directions—their loud, harsh screams echoing among the forests through the calm air—wheeling and turning before they alight on the tops of the palms to feed. They belong to the Psittacidae, or parrot tribe, and are known at once by the great length of their tails, and by having their cheeks destitute of feathers.

There are several species which frequent the trees growing on wet and swampy ground. The red and blue macaw, the largest and handsomest of the family, is well described by Waterton. Rare in size and beauty among all the parrots of South America, the *macrocercus macao* will force you to take your eyes from the rest of animated nature and gaze at him. His commanding strength, the flaming scarlet of his body, a lovely variety of scarlet, yellow, blue, and green in his wings, the extraordinary length of his scarlet and blue tail, seem all to join and demand for him the title of Emperor of all the Parrots.

When the coucourite palm-trees have ripe fruit on them, they are covered with this magnificent parrot. He is not shy or wary. You may take your blow-pipe and a quiver of poisoned arrows, and kill more than you will be able to carry to your hut. They are very vociferous; and, like the common parrots, rise up in bodies towards sunset, and fly, two and two, to their places of rest. It is a grand sight to see thousands of aras flying over your head, low enough to let you have a full view of their flaming mantles. The Indians find the flesh very good, and the feathers serve for ornaments in their head-dresses.

Bates saw a flock feeding on the fruits of a *Bacana* palm, and looking like a cluster of flaunting banners beneath its dark green crown.

They build their nests in the hollows of decayed trees, and lay twice in the year—generally two eggs at a time, the male and

female alternately watching over them. They are said to increase the size of the hole with their powerful beaks, should it not be sufficiently large for their purpose. They fly to a distance of several miles to feed, but—like rooks in England—return to their homes in the evening.

This macaw frequently measures, from the tip of the bill to the extremity of the tail, forty inches and more.

There are, besides, several other species of the red and yellow, blue, and blue and yellow, which equal the scarlet and blue in size,—their habits being very similar. They are easily tamed, and can be taught to repeat words, and sometimes even phrases. They are remarkable for their longevity, some having been known to live to one hundred years.

The magnificent great green macaw is noted for his depredations on the maize-fields; but, being a sagacious bird, he always places a sentinel to give the alarm to his marauding associates when danger approaches.

Parrots.

Parrots much inferior in size and less richly decked fly amid the foliage in vast numbers. The two most common species are the Amazon green parrot and the festive green parrot.

Of the former (*Psittacus Amazonius*) there are several varieties. They have their homes in the midst of the impenetrable forests. The female lays four white eggs in the hollow of a tree. The usual length is about fourteen inches. The bills vary in colour; the plumage is of a bright green, with the feathers marked by dusky or blackish margins. On the top or edges of the shoulders there is a brilliant scarlet patch, bounded by shades of blue, green, and yellow. A bright blue band reaches from eye to eye, beyond which the feathers of the crown, cheeks, and throat are of a rich yellow.

The Brazilian green parrot is a large and beautiful bird, of a fine grass-green, rather paler beneath the feathers, edged with purplish-brown. The front and round the base of the bill is bright red, the cheeks rather deep blue, and the top of the head yellow. The edge of the wings, at some distance from the shoulders, is red. The tail is especially handsome, the outside feathers being deep blue, tipped with yellow; the next red, with a similar yellow tip; and all the remaining ones green, with yellow tips. The bill is of a light colour, and the legs and feet

dark. It is the species most ordinarily brought to England, and is valued on account of its powers of imitation—individuals having been taught not only words, but whole sentences.

Anaca Parrot.

One among the most rare of the beautiful parrot family is the anaca (*Derotypus coronatus*). It is of a green colour, and at the back of its head rises a hood of red feathers bordered with blue, which it can elevate or depress at pleasure. It is the only American parrot which resembles the cockatoo of Australia. It is of a solemn, morose, and irritable disposition. The natives often keep the bird in the house for the purpose of seeing the irascible creature expand its beautiful feathers, which it readily does when excited. The crest is something like that of a harpy eagle. It is known also as the hawk-headed parrot.

Marianna Parrot.

There is also a beautiful black-headed species—the macái of the Indians—known as the marianna. It has a white breast, orange neck and thighs. It is a remarkably lively little bird, and when tamed, shows its playful and inquisitive disposition.

Wallace describes one which he had on board his canoe, which used to climb into every crack and cranny, diving into all the baskets, pans, and pots it could discover, and tasting everything they contained. It was a most omnivorous feeder, eating rice, farina, every kind of flesh, fish, and vegetables; and drinking coffee too. As soon as it saw him, basin in hand, it would climb up to the edge, and not be quiet without having a share; which it would lick up with the greatest satisfaction, stopping now and then to look knowingly round,—as much as to say, “This coffee is very good,”—and then sipping again with increased gusto.

It has a pretty, clear whistle, which the Indians imitate, making it reply, and stare about in a vain search for its companions.

Trogons.

Among the smaller birds in these forests, the trogons—a genus of scansorial birds—are the most beautiful, surpassing their relatives found in other parts of the world. There are numerous varieties, differing in size—from the trogon viridis, scarcely larger than a sparrow, to the beautiful trogon, with its handsome tail, the size of a rook. Often they are to be seen in

the depths of the forest, sitting motionless for hours together, simply moving their heads, watching apparently for insects, or sometimes scanning the neighbouring trees for fruit. Having selected a ripe one, they dart off now and then at long intervals to secure it, returning always to the same perch.

Their wings are feeble, and they are of a dull, inactive temperament. They have long spreading tails, and a dense plumage, which makes them appear larger than they are in reality. They are solitary birds, and may be seen sitting singly, or in pairs—some species on the taller trees, and others but a few feet above the ground—occasionally uttering a mournful note, which sounds like *curucua*,—the name which the Indians give to them. "This would betray them to the hunter," says Edwards; "but they are great ventriloquists, and it is often impossible to discover them, though close above one's head."

Their feathers are fixed in a very loose manner, so that in falling, when shot, numbers fall off.

The Resplendent Trogon.

The resplendent trogon—the largest of the species—is one of the handsomest of birds, on account of the richness and brilliancy of its colour, the beautiful blending of tints, the flowing grace of its plumage, and the elegance of its colour. On its forehead is a curiously-shaped tuft, of slight and elastic feathers which curl over something like those of the umbrella-bird. This ornament—as also the head, throat, back, wings, and upper tail-coverts—is of the very richest green, with a gloss of gold, which glows, when moved by the breeze, with a changeable sheen. The upper tail-coverts are exceedingly long, projecting considerably beyond the tail, and flowing gracefully over the stiffer feathers beneath them. The lower part of the body is of a rich carmine.

Another species, called by the natives the *curucua grande*, has a soft, golden green plumage, a red breast, and an orange-coloured beak.

In the Gapo territory a yellow-bellied trogon, with a back of a brilliant metallic green colour, and a breast of steel-blue, is found.

The trogon *melanurus* is remarkable for the beauty of its plumage, having a glossy green back and rose-coloured breast. Bates found one seated alone on a branch, at no great

elevation, uttering at intervals, in a complaining tone, its usual cry of "quaqua." It appeared to be a dull, inactive bird, and even when approached seemed very unwilling to take flight.

Jacamars.

Among the characteristic members of the feathered tribe in these forests are the jacamars, as they are found in no other part of the world. They have straight, long, pointed bills, with a keel on the upper mandible. Some species have only three toes, while others possess the usual number of four. They live on insects, but in many respects resemble the trogon; being even still less disposed to fly than they are. "Their stupidity, indeed, in remaining at their posts, seated on low branches in the shady parts of the forest, is somewhat remarkable in a country where all other birds are exceedingly wary," observes Bates.

The green jacamar (*galbula viridis*) is a beautiful bird, about the size of a lark; the upper parts of the body being generally of an exceedingly brilliant, changeable green, glossed with copper-gold. The beak is two inches long, black, slightly incurved, and sharp-pointed. The legs are short and weak, of a greenish-yellow, and the claws black. It is a very solitary bird, and delights to take refuge in the thickest parts of the forest, where insects abound, and is seldom seen in company with others. It has a short, quick flight, and a sweeter voice than most of its feathered companions.

The paradise jacamar (*galbula paradisea*) frequents the more open parts of the forest, and is generally found in pairs. It is a larger bird than the former, being nearly a foot long. The prevailing plumage is green, but the throat, front of the neck, and under wing-coverts are white.

It seizes its food in the same way that the trogons do. It will sit silent and motionless on a branch, moving its head slightly, and when an insect passes by, within a short distance, it will fly off and seize it with its long beak, and return again to its perch.

Most jacamars are clothed with a plumage of the most beautiful golden, bronze, and steel colours. They bear a strong outward resemblance to kingfishers, but are not further united to that group of birds. They appear to have the same peculiar attachment to particular branches as many humming-birds possess; and the spot can generally be discovered by the number of legs and wings and hard cases of the insects they

have caught, and which they have plucked off before eating their victims.

The little three-toed jacamar possesses a few of the brilliant hues which adorn his brethren.

The great or broad-billed jacamar is very like a kingfisher. The beak is very broad, while the dilated ridge on the upper mandible is distinctly curved. It feeds very much like the kingfisher,—darting down from a branch to secure, with its bill, the active insects as they fly by. It feeds exclusively on them, however, never attempting to obtain food from the waters.

The Jacana.

The light-bodied jacana, supported by its spider-like, widely extended feet, treads over the floating pan-like leaves of the Victoria Regia, and other aquatic plants, without sinking them in any perceptible degree below the surface of the calm pools in which they float. They take up their dwelling on the borders of the remote lakes and igarapes of the Amazonian Valley.

They are called by the natives oven-birds, because frequently seen on the pan-shaped leaves of the before-mentioned magnificent lily.

The common jacana has a black plumage, with a greenish gloss. The legs are very long and slight,—as are the toes and claws, especially that of the hind-toe, which is nearly straight. The body is about ten inches long; and the beak upwards of an inch, and of an orange colour.

The jacana feeds on aquatic insects and vegetable matter. While feeding it utters a low-sounding cluck, cluck, at short intervals. When flying it throws out its long legs horizontally to their full length, generally skimming above the surface, out of danger.

Its body is of a peculiarly light construction, so that, large as it appears, it weighs but little when pressing the floating leaves, on which it delights to walk in search of its prey.

Frigate-Bird Pelicans.

Even to the distance of fifteen hundred miles and more from the mouth of the Amazon, large flocks of the high-flying frigate-birds are descried hovering at an immense height above the stream, preparing to plunge down and seize their finny prey.

They measure seven feet from wing to wing, and appear almost to live in the air. The neck is partly bare, and very extensible; the bill long, and hooked at the end; the feet small, and webbed. The body of the male is entirely black, while the hen has the head and neck white.

It is probably a different species from the frigate-bird, or sea-hawk, of the Eastern tropical seas.

The Horned Screamer.

On the shores of a sand-bank, flocks of wild gulls may be seen flying overhead uttering their well-known cries, sandpipers courting along the edge of the water, here and there lonely wading birds stalking about, and among them the curious *Palamedea cornuta*—the anhimas of the Brazilians, or the horned screamer of Cuvier—called also the kamichi. Startled by the approach of the canoe, up it flies, its harsh screams resembling the bray of a jackass—but shriller and louder, if possible—greatly disturbing the calm solitude of the place.

It is the size of a swan, but more nearly resembles a crane. On its head it wears a long, pointed horn, surrounded with small black and white feathers. It has a tail about eight inches long; its wings, when folded, reaching to more than half the length of the tail. They are armed with sharp spines, with which it can inflict a wound on its foes, and which assist it in repelling the attacks of snakes and guarding its young from their rapacity. Unless when attacked, however, it seldom uses its weapon of defence. It walks boldly along, as if conscious of its power; and when on the wing, has a strong and easy flight.

The head and neck are of a greenish-brown colour, and covered with soft feathers. The back is black, except the upper part, which is brown, with yellow spots; the whole lower part, with the thighs, of a silvery white.

It feeds on grain and aquatic plants, in search of which it wades through the reptile-haunted morasses.

Vultures.

Monarch of the feathered tribes of the forest, the king vulture fears no rival throughout his wild domain. While the condor has its home on the mountain-tops, the sovereign of the vultures confines himself exclusively to the thickly-wooded regions along

the banks of the rivers or lagoons, where he can more readily obtain the carcasses on which he feeds.

He is a magnificent bird, of about two feet and a half in length, and upwards of five feet across the expanded wings. The neck is brilliantly coloured of a fine lemon tint; both sides of the neck, from the ears downwards, are of a rich scarlet. The crown of the head is scarlet, and between the lower mandible and the eye, and close to the eye, there is a part which has a fine blue appearance; the skin which juts out behind the neck, like a carbuncle, is partly blue and partly orange. The bill is orange and black. Round the bottom of the neck is a broad ruff of soft, downy, ash-grey feathers, and the back and tail-coverts are of a bright lawn. The middle wing-coverts and tail-feathers are glossy black.

These superb birds may sometimes be seen seated in pairs on the topmost boughs of trees, but occasionally in large flocks. The great expanse and power of his wings enables the king vulture to soar to a prodigious height, whence he can survey with his piercing sight a wide extent of his domain; possibly also his exquisite sense of smell enables him to detect the odour of the putrefying carcass which rises through the pure air.

He is somewhat of a tyrant among his subjects; for not only will he allow no other vultures or carrion-feeding birds to approach the carcass he has selected, but on his appearance the other species, who may already have discovered it, fly to a distance, and stand meekly looking on while their sovereign gorges himself.

The king vulture makes his nest in the hollow of a tree, where his queen lays two eggs.

The Black Vulture.

The gallinaso, or black vulture (*Cathartes atratus*), acts the part of a scavenger, and as such is of great use throughout the whole centre of South America, as also in the northern continent. Disgusting as are its habits and appearance, it is carefully protected, on account of the service it renders to mankind.

It may easily be distinguished from the turkey-buzzard, which it greatly resembles, by the shape of the feathers round its neck, which descend from the back of the head towards the throat in a sloping direction; whereas those of the turkey-buzzard form a

ring round the throat. Its general colour is a dull black. The head and part of the neck are destitute of feathers, wrinkled, and sprinkled with a few black hairs. The throat is of a yellowish tint.

It flies high, sweeping through the air with a beautifully easy motion, and is generally found in the neighbourhood of fresh-water.

The black vultures are gregarious, brought together apparently by the pleasure they seem to have in society rather than by the attraction of a common prey. Darwin describes seeing flocks of them on a fine day at a great height, each bird wheeling round and round without closing its wings, and performing the most graceful evolutions.

The Turkey-Buzzard.

The turkey-buzzard (*Cathartes aura*) is similar in its habits to the black vulture, and is frequently mistaken for it. It is seldom found southward of latitude 41 degrees. Of late years, however, they have become numerous in the Valley of the Colorado, three hundred miles further south. It is not found on the desert and arid plains of Northern Patagonia, except near some stream; and it is supposed not to have passed into Chili, although in Peru it exists in great numbers, where it is preserved to act the part of a scavenger.

It is a solitary bird, and goes in pairs; and may at once be recognised at a distance, from its lofty soaring and most elegant flight. It ranges from North America to Cape Horn.

Such are some of the more notable members of the feathered tribes inhabiting the Valley of the Amazon. There are numberless others,—both land and water birds,—a description of which would occupy too much space, some of them also being common to other parts of the world. Several, likewise, are seen more frequently either in Venezuela and Guiana, or in the La Plata region, and will be noticed when we visit those countries.

From the Birds, then, we will pass on to the Reptiles and Insects of South America; in which, as to number and the variety of their forms and habits, it equals, if it does not surpass, any portion of similar size of the Old World, in the same latitude.

Part 3—Chapter XIV.

Reptiles.

Alligators.

Along the river-banks, in every igarape, stream, and pool, the hideous and ravenous alligator lurks for its prey. It is greatly dreaded by the natives for its treachery and cunning, numbers falling victims to its powerful jaws. The largest, the jacare-uassu, or great cayman, is often found from fifteen to twenty feet long, and of enormous bulk.

There is a smaller species, the jacari-tinga, which has a long slender muzzle, and black banded tail. This, when full-grown, is about five feet long.

A still smaller one exists, said to be found only in shallow creeks. It does not attain, when full-grown, a length of more than two feet. Its eggs are rather larger than those of a hen, and oval in shape, the shell having a rough, hard surface. So numerous are they, that Bates observes "it is scarcely exaggeration to say that the waters of the Solimoes are as well stocked with alligators in the dry season, as a ditch in England is in summer with tadpoles."

Like the turtle, the large alligator has its annual migrations. During the wet season it retreats to the interior pools and flooded forests, and descends to the main river in the dry season. During the hot months, when the pools are dried-up, and the alligator cannot reach water, it buries itself in the mud, and becomes dormant, sleeping till the rainy season returns.

As the alligator cannot turn its head, it is little feared on shore, as a person can easily leap out of its way; but he must beware of its tail, which, when angry, it will lash about in a furious manner, sufficient to break a limb. The alligator never attacks human beings when on their guard, but, lying in wait, seizes them when he can venture, to do so with impunity. These savage saurians are called indiscriminately, though improperly, alligators, crocodiles, and caymans.

The real alligator is distinguished by having its toes only partly webbed—the outer ones being free. It will never willingly seek an encounter, and shows great terror, even, when attacked by dogs. The creatures are often killed by jaguars, who pounce upon them, and with their powerful claws tear out their entrails.

But when aroused to anger it blindly attacks all opponents, and is then a truly formidable foe. With a single blow of its tail it can overturn a canoe. The instant it seizes its prey it sinks with it below the surface, to devour it at its leisure. It usually feeds on fish, fowl, turtle, or any creature it finds floating on the surface of the water; but when these fail, it lies concealed among the sedges on the banks, waiting for any land animal which may approach to drink. Sometimes it thus retaliates on the jaguar, and seizing the fierce brute, drags it down below the surface, where it is soon drowned.

The great alligator usually lays fifty or sixty eggs, rather oblong than oval, and about the size of those of a goose,—covering them up with sand, and allowing them to be hatched by the heat of the sun. The mother, however, does not desert her young, but conducts them to the water, and watches over them till their scales have hardened, and their limbs have gained sufficient strength to enable them to take care of themselves.

Waterton relates an anecdote showing the daring ferocity of the creature when pressed by hunger. It was on the banks of the Orinoco, near the city of Angostura. The tale was told him by the governor of that place.

"One fine evening, as the people of the city were sauntering up and down the *alamada* by the banks of the river, a large cayman rushed out of the water, seized a man, and carried him down, before any person had it in his power to assist him. The screams of the poor fellow were terrible as the cayman was running off with him. The monster plunged into the river with its prey, and we instantly lost sight of him, and never saw or heard of him more."

Bates also relates that a native crew, having arrived at Egga, got drunk, when one of the men, during the greatest heat of the day, while everybody else was enjoying an afternoon nap, took it into his head, while in a tipsy state, to go down alone to bathe. He was seen only by a feeble old man, who was lying in his hammock in the open verandah at the rear of his house, at the top of the bank. He shouted to the besotted Indian to beware of an alligator which had of late taken to frequenting the neighbourhood. Before he could repeat his warning, the man stumbled, and a pair of gaping jaws, appearing suddenly above the surface, seized him round the waist, and drew him under the water. A cry of agony—"Ai Jesús!"—was the last sound made by the wretched victim. The young men of the village, going in search of the monster, came up with it when, after a little time, it rose to breathe, with one leg of the man sticking

out from its jaws. It was immediately despatched, with bitter curses.

One night Bates and his party were asleep in their hammocks in an open shed on the banks of the river, with a fire made up in the centre. He was awoken by his attendants hurling burning firewood, with loud curses, at a huge cayman which had crawled up the bank, and passed beneath his hammock towards the place where a little dog lay asleep. The dog had raised the alarm in time. The reptile backed out, and tumbled down the bank into the water, the sparks of the brands hurled at him flying from his back and sides. Notwithstanding this, the next night he repeated his visit.

The alligator, in its daring attempts to seize human beings, does not always come off victorious. An Indian and his son had gone down to the water, when the boy, whilst bathing, was seized by the thigh, and carried under. The father, rushing down the bank, plunged after the rapacious beast, which was diving away with its victim. He followed it unarmed, and overtaking the creature, thrust his thumb into its eye, and forced it to release its booty. The lad, who was present when the story was told, exhibited the marks of the alligator's teeth in his thigh.

On another occasion an alligator was shot by one of the passengers on board a steamer, and hauled up on deck. When the knife was applied, it showed that it still possessed some sparks of life, by lashing out its tail, and opening its enormous jaws, sending the crowd of bystanders flying in all directions. It is extraordinary how tenacious the creature is of life, and what a prodigious amount of battering it may receive and still live.

Fortunately for other animals, the young alligators have numerous enemies, even the males of their own kind occasionally gobbling them up; while they are terribly persecuted by wild beasts and birds of prey,—the latter esteeming their soft bodies delicate morsels, and frequently pouncing down into their midst and carrying them off.

The alligator, far from being a silent animal, as is generally supposed, makes a hideous noise at times, bellowing with so singular a cadence and loud a din, that he can even out roar the jaguars and mycetes.

Sir Richard Schombergh describes the way in which the alligator seizes its prey. He secured a bird or fish to a piece of wood, and then turned it adrift on the river. No sooner was it seen than a cayman, slowly and cautiously approaching—without even

rippling the surface of the water—and then curving its back, hurled its prey by a stroke of its tail into its wide-extended jaws.

It makes also a loud sound, by clacking its teeth, and lashing its tail on the water. It has a voice not readily to be distinguished from that of the animals of the forest. It is similar to a hollow suppressed sigh bursting forth on a sudden, loud enough to be heard a mile off. First one gives vent to this fearful sound, then another answers from a distance; and from up and down the river, and across the current, these horrible noises are heard, showing that the hideous saurians are in a lively mood, watching for their suppers. It is supposed that when once they have tasted human flesh they will always endeavour again to procure it.

Humboldt mentions another instance, where an Indian, landing on the banks of a shallow lagoon, was seized by a cayman. With wonderful presence of mind the Indian searched for a knife, but not finding it, he pressed his fingers into its eyes. The monster, however, did not let go, but dragged the unfortunate man down into deep water, and, to the horror of several spectators, was seen swimming off with the poor fellow in its jaws, to devour him on a neighbouring island.

Humboldt states that during the inundations of the Orinoco, alligators have been known to crawl into the streets of Angostura and carry off human beings.

Schombergh once saw an enormous cayman seize one of a smaller species, and bear it away—not, however, without a desperate struggle. In a short time the monsters reappeared, wildly beating the surface with their tails. Now a huge head rose up, now a tail, indistinctly seen in the seething whirlpool. At length, however, the larger was beheld swimming off to a sand-bank, where it immediately began to devour its prey.

The Iguana.

See yonder hideous-faced creature, nearly six feet in length, the size of many alligators, its head covered with scaly plates, a huge dewlap depending from its throat, its body and long tail covered with small imbricated scales, its back garnished with a row of spines, and on its thigh a number of porous tubercles, while its legs and claws are wide-spreading.

As it crawls along a bough overhead, the bravest man who had never before seen it would undoubtedly get out of its way, expecting it to leap down and seize him. Yet the iguana, ugly as is its countenance, is perfectly harmless; except that it can give a sharp bite with its compressed triangular and serrated teeth. It lives generally on trees. When hard-pressed it takes to the water, and swims with ease,—pressing its legs close to its sides, and sculling itself on with its tail; while it can remain an hour or more under water without suffering.

The flesh of the iguana, unfortunately for itself, is considered excellent; and hunters go out to catch it with a noose at the end of a long stick, which they cast round its neck, and then by a sudden jerk pull it to the ground. As the creature seems to fancy that it cannot be reached on the bough, it seldom moves on the approach of the hunter, and is thus easily caught. It lashes out with its tail, however, and tries to bite, when once it finds itself entrapped; and being also very tenacious of life, it is not killed without repeated heavy blows, or a pistol-shot in its head.

The common iguanas are numerous in the neighbourhood of villages, where they climb the trees for the sake of their fruit. Some species lay their eggs—which are about an inch and a half in length, and oblong—in hollow trees. Others are known to do so in the sand, to be hatched by the heat of the sun. They are considered delicacies, and are much sought after in consequence.

The colour of the iguana changes, like that of the chameleon. The Brazilians, indeed, call it the chameleon. Its food consists almost entirely of fruits and other vegetable substances, though some species are supposed to be omnivorous. The natives frequently tame it, when it willingly allows itself to be carried about by its owner, though it at once distinguishes strangers.

There are, however, numerous species of iguanas; indeed, the family contains fifty genera—the true iguanas being all inhabitants of the New World. To its predecessor, which it closely resembles in bony structure, the largest is but a mere pigmy—for that extinct monster must have been about seventy feet in length, the length of the tail alone being fifty-two feet, and the circumference of the body fourteen and a half feet; while its thigh-bone was twenty times the size of that of the modern iguana. Vast as was the inhabitant of the ancient world, it was herbivorous, like that of the comparatively Lilliputian creature of the present day.

Everywhere the agile, beautifully-tinted lizards abound, sunning themselves on logs of wood, or scampering over the sandy soil. Now they may be seen turning round the trunk of a tree, much as a squirrel does, watching the passer-by, and trying to keep out of sight. Some are of a dark coppery colour, others have backs of the most brilliant silky green and blue, while others are marked with delicate shades of yellow and brown.

The largest of their family is the teguexin, or variegated lizard. Sometimes it is called the safeguard, from the idea—probably an idle fable—that, like the monitors of the Nile, they give notice of the approach of the alligator by their loud hissing.

There are several species which inhabit the hot, sandy plains, or dense, damp underwood near the rivers and lakes. One of them exceeds five feet in length, and is extremely active. It feeds almost entirely on snakes, frogs, and toads, but occasionally devours poultry, and breakfasts off their eggs. It is also somewhat of a cannibal, for though it will not eat its own species, it does occasionally those of a somewhat smaller lizard allied to it. It possesses strong teeth, and can bite with great force; indeed, when attacked it defends itself fiercely, and when seizing a foe can seldom be compelled to let go.

Its colour is variable, but generally the upper parts of the body are deep black, with mottlings of yellow or green; while on the higher portions of its sides are a series of white spots, the under part being chiefly yellow, with black bands.

The little ameiva, on which it occasionally preys, is of a dark olive colour, speckled with black about the neck.

There is another large lizard, known as the great dragon (*Ada Guianensis*). It is of an olive colour, with yellow below, and mottled with brown; and frequently attains a length of six feet. While the former cannot climb trees, it is a good swimmer. The great dragon climbs with wonderful agility, but is said not to be very much at home in the water. It also bites fiercely.

Both are hunted for the sake of their flesh; while their eggs—of which thirty or forty are laid—are considered great delicacies.

Geckos.

Not only in the huts of the natives, but in the abodes of the wealthy white men, hid during the day in dark corners, are numbers of dark grey, hideous-looking lizards, which, when

night comes on, crawl rapidly over the walls and ceilings, hunting for the flies and other insects to be found there. Repulsive as are these little geckos, and undeservedly possessing a bad name for being poisonous, they are not only harmless, but render good service by the destruction of numerous household pests. Their large eyes are so constructed that they can discern objects in the dark, and are at the same time capable of bearing the rays of the bright sun. Their colour, too, enables them to escape detection by the creatures which attack them, while they are thus hid from the prey for which they lie in wait. They can also bend themselves in an extraordinary way into hollows and crevices.

But their feet are especially curious, being admirably adapted for clinging to and running over smooth surfaces. The under side of their toes is expanded into cushions, beneath which folds of skin form a series of flexible plates. By means of this apparatus they can run or crawl across a smooth ceiling with their backs downwards—the soft soles, by quick, muscular action, exhausting and admitting air alternately. They are also provided with sharp claws, which enable them to climb up the trunks of trees, and over rough surfaces.

The Brazilians call them *osgas*, and believe that they poison by their touch whatever they pass over. Probably, however, if any annoyance does arise from them, it is when with their sharp claws they run across a sleeping man, or small blisters have been raised by the adhering apparatus at the bottom of their feet. By some “the spider, which taketh hold with her hands,” is believed to be a gecko, as a species of this creature is very common in the East. The popular prejudice against them causes the death of many a poor gecko, who, had he been allowed to live, would have rendered good service to his persecutors. Those in the houses are of small size; but others, existing in the forest, and living in the crevices of the trees, are of considerable magnitude. Their tails are easily struck off—the loss being, however, as is the case with other lizards, repaired by a new growth, though less perfect than the original member.

The Anaconda.

With its ill-favoured head protruding above the surface of the water near the banks of slow-flowing rivers, pools, and swamps, the vast anaconda lies in wait for its prey. The fish swimming along in its neighbourhood,—the birds which, rising from the reeds, skim by overhead,—the animals which come to the banks to drink,—even man himself, have cause to dread a blow from

the snout, and the powerful coils of the huge water-serpent. Its appearance is most hideous, being very broad in the middle, and tapering abruptly at both ends. Fish, and the smaller animals, it swallows whole; but a larger animal it seizes by the nose with its powerful jaws, and surrounds with the mighty coils of its huge body, pressing one coil upon another till it crushes its prey to death.

Though generally found from twenty to thirty feet in length, it is said to attain a length of forty feet; and one of that size is fully capable of swallowing an ox or horse,—there being many instances of its having been done. Its voracity is prodigious. The French naturalist Firmin found in the stomach of an anaconda a large sloth, an iguana four feet long, and a good-sized ant-bear; all three in the same state almost as when they were swallowed—a proof that they had been captured within a short time. Bates relates that an Indian father with his son went one day in their montario to gather fruit a short distance from Egga, when, landing on a sloping, sandy shore, the boy was left to take care of the canoe while the man entered the forest. The boy was playing in the water under the shade of some myrtle and wild guava trees, when a huge reptile stealthily wound its coils round him. His cries brought the father to the rescue, who, rushing forward, seized the anaconda boldly by the head, and tore its jaws asunder.

This formidable serpent lives to a great age; and Bates heard of a specimen being killed which measured forty-two feet in length. Those he measured were only twenty-one feet long, and two feet in girth. He was a sufferer, on one occasion, from one of these. While on a voyage up the river, his canoe being moored alongside the bank, the neighbourhood of which had been haunted for some time past by one of the creatures, he was awoke a little after midnight, as he lay in his cabin, by a heavy blow struck at the side of the canoe, close to his head. It was succeeded by the sound of a heavy body plunging into the water. When he got up all was again quiet, except the cackle of fowls in the hen-coop, which hung at the side of the vessel, about three feet from the cabin door. In the morning the poultry were found loose about the canoe, two of the fowls being missing; while there was a large rent in the bottom of the hen-coop, raised about two feet from the surface of the water. The Indians went in search of the reptile, which, being found sunning itself on a log at the mouth of a muddy rivulet, was despatched with harpoons.


It is extremely tenacious of life; and though the head may be nearly cut off, and the entrails taken out, it will still move about for a considerable time. It is detested by the farmers on the banks, as it has the habit of carrying off poultry, young calves, or any animal it can get within reach of. It is often seen coiled up in the corner of farm-yards, waiting for its prey.

The statement that the anaconda kills its prey by its pestilent breath, is wholly fabulous. Waterton altogether denies the existence of any odour in the snake's breath. It is possible, however, that some species may produce a horrible stench, from a substance secreted in certain glands near the tail—a fact which has probably given rise to the fable.

The Boa.

Among the semi-civilised, idolatrous inhabitants of the continent, several snakes were objects of worship. The boa-constrictor especially was regarded as an emblem of strength and power, from its vast size, and the fearful effect produced by its encircling coils as it winds itself round the body of its victim.

See the creature as its shining body moves rapidly among the fallen leaves and dried husks in the forest, rather like a stream of brown liquid than a serpent, with skin of varied colours! Onwards it goes, with scarcely a perceptible serpentine movement. Even the huge trunk of a fallen tree does not stop it, but it glides over the impediment in its undeviating course, making the dry twigs crack and fly off with its weight. Now it stops, watching for its prey. An agouti runs by, regardless of the seeming rivulet; but the hapless creature is seized by the serpent's jaws, and those terrible folds surrounding the body—coil above coil—crush the bones, till it becomes a mere mass of flesh. And now it begins to suck in its prey; not lubricating it, as is generally stated, although a large quantity of saliva surrounds

the animal while it is  descending the monster's throat. After a time the meal is finished, and the serpent—its body greatly distended—remains at rest, unwilling to move, when it may be easily captured by the daring hunter.

The body of the boa is of a rich brown colour. A broad chain of large black spots, alternating with white, runs along its back; while the scales round the eyes are set in a circle, separated from those of the lips by two rows of smaller scales. The jaws are not united, but attached to the skull by muscles and ligaments, which enable it to dilate the mouth sufficiently to swallow bodies much larger than itself.

The largest grow to a length of thirty feet and upwards; but boas ordinarily do not attain more than twenty feet in length.

The Spotted Boa.

The boa scytale, or spotted boa, is of a greyish colour, marked with round spots, and scarcely inferior in size to the former.

The Ringed Boa.

There is another species—the ringed boa, or *boa cenchris*—which, though growing to a considerable size, does not attain that of the former species.

A curious species (the *boa canina*) has a large head, shaped somewhat like that of a dog; the general colour a bright Saxon-green, with transverse white bars down the back. The sides are of a deeper green, and the belly is white.

Wallace describes a small one only eleven feet in length, but as thick as a man's thigh. It was secured by having a stick tightly tied round the neck. It went about dragging its clog with it, sometimes opening its mouth with a very suspicious yawn, and sometimes turning its tail up into the air. Being put into a cage, and released from the stick, it began to breathe most violently, the expirations sounding like high-pressure steam escaping from a Great Western locomotive.

The boa, however, is not much dreaded in South America, as it seldom or never attacks man; which the anaconda is said always to do, if it can find him unprepared. Stories are told of desperate encounters between travellers in the forests of the Amazon and pythons or boas. A French traveller narrates how, on one occasion, the whole of his attendants took to flight on seeing a huge python approaching,—with the exception of a gallant native, who, attacking the monster vigorously with a long, lithe pole, struck it a blow which paralysed its powers; when, the party returning, it was easily killed.

The Rattlesnake.

Venomous as is the bite of the rattlesnake, and abounding as it does in all parts of the continent, it is less dreaded than many other serpents. It is, in the first place, very sluggish in its habits; and it is happily compelled to bear about it an instrument which gives notice of its approach and intention of biting. The South American rattlesnake—the *Boaquirá crotalus*

horridus—has the rattle placed at the end of the tail. It consists of several dry, hard, bony processes, so shaped that the tip of each upper bone runs within two of the bones below it. By this means they have not only a movable coherence, but also make a multiplied sound, each bone hitting against the others at the same time. The rattle is placed with the broad end perpendicular to the body, the first joint being fastened to the last vertebra of the tail by means of a thick muscle under it, as well as by the membranes which unite it to the skin. Indeed, an idea of this curious structure may be formed by placing a number of thimbles one within the other. These bony rings increase in number with the age of the animal; and they are generally found with from five to fourteen. The sound produced has been compared to that of knife-grinding. It cannot be heard at a distance, and in rainy weather is almost inaudible.

The effects of the bite vary according to the season of the year; indeed, at times it will seldom strike a foe, and the venom is comparatively mild in its effects. At other times the poison is of deadly intensity, and, should a large vein be bitten, the victim speedily dies.

Waterton describes handling a number of rattlesnakes—removing them from one apartment to the other—with his hands alone. They hissed and rattled when he meddled with them, but did not offer to bite him. Possibly this might have occurred during the time when they were sluggish, and their venom less deadly.

The little peccary is a great enemy of the rattlesnake, as it is of all other serpents, and ordinary hogs destroy it easily without suffering from its bite; so that as man makes progress through the country and introduces these animals, rattlesnakes speedily disappear.

Although the fascinating powers of the rattlesnake have been doubted, it seems probable that small birds and animals are frequently attracted when they catch sight of it coiled up on the ground below the branches on which they are posted—and, if not fascinated, fall through terror into its open jaws; or it may be that, influenced by the same overpowering impulse which induces human beings to rush into danger, the animal or bird, on beholding its deadly enemy, approaches it against its own will, and is drawn nearer and nearer, till it either falls into the deadly fangs, or comes near enough to be entrapped.

Bates was one day in a forest with a little dog, which ran into a thicket and made a dead-set on a large snake whose head was

raised above the herbage. The serpent reared its tail slightly in a horizontal position, and shook its terrible rattle. It was some minutes before he could get the dog away. This shows how slow the reptile is to make the fatal spring.

On another occasion, he heard above his head, as it seemed, a pattering noise, when the wind, which had been blowing, lulling for a few moments, he discovered that it proceeded from the ground, and, turning his head, was startled by a sudden plunge, a heavy gliding motion betraying a large rattlesnake making off almost beneath his feet.

The Fer De Lance.

More dreaded than the jaguar or alligator is the jararaca—the native name for the terrible serpent, the fer de lance (*Craspedocephalus lanceolatus*). The hideous creature, with brown colour, flat, triangular head, connected to its olive-tinted body by a thin neck, lies coiled up among a heap of leaves, from which it can scarcely be distinguished till the passer-by is close upon it; then suddenly it rears its head, which is armed with four long poisonous fangs, and, darting forward, strikes its victim with a deadly blow. Man, as well as all animals, dreads it—except the hog, and its relative, the little peccary, which are indifferent to the effects of its poison.

On human beings its bite is generally fatal. Bates mentions several instances of death from it, and only one clear case of recovery,—but in that instance the person was lame for life. Although most other serpents fly from man, the jararaca frequently attacks him; leaping from its concealment among the leaves, and inflicting a wound which in a few hours produces death. The first symptoms caused by the poison are convulsions, pains at the heart, and distressing nausea, the whole nervous system appearing to be greatly affected. The only known remedy is the copious use of spirits, a large amount of which is required to counteract the enervating power of the poison.

The jararaca is generally six feet long, but sometimes reaches the length of eight feet. It is marked with dark cross bands, while below it is of a whitish-grey hue, covered with small dark spots.

Even birds seem to have a slight dread of this fearful serpent, and may be seen hovering about the spot where it lies coiled up, uttering cries and screams, produced by fear and anger.

The Bushmaster.

Almost as much dreaded as the jararaca is the enormous cuanacouchi (*Lachesis mutus*), or bushmaster, as it is called in Demerara. Its proper name is the curucucu. It sometimes reaches to a length of fourteen feet, being the largest known poisonous snake. It is equally remarkable for the glowing radiance of its fearful beauty, displaying as it does, when gliding amid the sunshine, all the prismatic colours. Though generally remaining on the ground, it mounts trees with perfect ease in search of its prey—birds or their eggs; while from the overhanging bough it can dart down on the unwary passer-by.

It is said that furious battles sometimes occur between snakes of different species,—that the boa will watch for the rattlesnake as it issues from its hole,—or that the latter will sally forth, and, relying on its envenomed fangs for victory, attack the huge boa as it glides by; though, as no naturalists appear to have witnessed such combats, it may be doubted whether they ever take place. But we may fancy how desperate would be the strife between a python and the venomous bushmaster of Demerara.

Labarri, or Elaps Lemniscatus.

The labarri—another beautiful snake, adorned with the colours of the rainbow—produces certain death by its envenomed bite. It, too, is a tree-climber, and may be seen lying coiled up on a low, thick branch or decayed stump, or sometimes on the bare ground, apparently selecting spots where it can be least easily distinguished. Though generally smaller than the bushmaster, it attains a length of eight feet or more.

Whip Snakes.

There are two or three species of whip snakes, or Dryadidae, remarkable for the slender elegance of their forms, and in general for the great beauty of their colouring, as well as for the rapidity of their movements. The whip snake, having seized its prey, winds its light and lithe body round its victim, coil upon coil, like the boa and anaconda, and strangles it in its embrace.

The emerald whip snake (*Philodryas viridissimus*) is one of the most beautiful. So slender is its body that, although two feet long or more, it can coil itself up within a space not larger than the hollow of the hand. It lives in trees, and may be seen sporting amid the branches; but the moment it catches sight of

a person, away it darts, scarcely moving the branches and leaves amid which it makes its way.

The Green Snake.

Delicate in form, and of the brightest grass-green—while, like the rest of its family, perfectly harmless—the green snake is a great favourite with the Brazilians; and as it is easily tamed, young girls may often be seen carrying it about, winding it round their throats or wrists, forming it into living necklaces or bracelets. It lives in trees, among the green foliage, over which it rapidly glides in search of insects—its usual food.

Frogs and Toads.

Frogs abound of all sizes, living in marshes, some on dry ground, and others inhabitants of trees—many with voices which resound loudly through the midnight air. Toads, too, are numerous, some of enormous size. They may be seen on bare, sandy places—huge fellows, seven inches in length and three in height—crawling over the ground, utterly indifferent to the appearance of a stranger among them.

Among the frogs is the curious tingeing frog (*Hylaplesia tinctoria*), which is an inhabitant of the forest. It may be seen during the day crawling along the branches, but at night it takes up its abode under the loose bark. Except during the breeding season, it seldom visits the water. It then, like the rest of its species, goes there for the purpose of depositing its eggs. It is generally of a dark colour—sometimes quite black—with a white spot on the head and two white lines running along each side.

It gains its name from the use the Indians are said to make of it. They employ it as they do the parrot-fish, to give a different colour to the plumage of their parrots. To do this they pull out the feathers from the spots to which they wish to impart a new tint, and then rub the blood of the frog into the wounded skin. When the new feathers grow, they are said to be of a bright yellow or vermilion hue.

The bi-coloured tree-frog (*Phyllomedusa bicolor*) is of considerable size, and is the only one of its family at present known. The upper part of the body is of the deepest azure-blue, while the under parts are of a pure white, sometimes of a rosy tinge. The thighs and sides are spotted with the same tinge as the abdomen.

Darwin found a curious little toad, the *Phryniscus nigricans*, on the dry sandy soil of the Pampas, "which looked," he says, "as if it had been steeped in the blackest ink, and then, when dry, allowed to crawl over a board freshly painted with the brightest vermilion."

Instead of being nocturnal in its habits, as other toads are, and living in obscure recesses, it crawls about over dry hillocks and arid plains during the day, where not a single drop of water can be found. It depends on the dew for its moisture, which is probably absorbed by the skin. The creature seems to dread water, and is utterly unable to swim.

The Surinam Toad.

The Surinam toad is one of the most curious, though, at the same time, among the most hideous of batrachians. It is remarkable on account of the extraordinary way in which its young are developed. The skin of the female is separated, as is the case with others of its family, from the muscles of the back, and is nearly half an inch thick. She deposits her eggs, or spawn, at the brink of some stagnant water, when the male manages to take them up in his paws and places them on her back, where they adhere by means of a glutinous secretion, and are pressed into cells which, at that time, are open to receive them. Gradually the cells are closed by a membrane which grows over them, when her back greatly resembles a piece of honeycomb, the cells of which are filled and closed. Here, in the course of about three months, the eggs are hatched, and the creatures undergo the usual change of the rest of the genus; first assuming the form of tadpoles, and gradually acquiring their complete shape. When perfected, and possessed of their limbs, they work their way out of the cells; and it is a curious sight to see them struggling out—their head and paws projecting in all directions from their mother's back—and sliding down on the ground, when they begin to hop merrily about.

The cells are considerably deeper than wide, and each would contain an ordinary bean thrust endwise into it. The head of the creature is of an unusual shape, as it has a snout with nostrils lengthened into a kind of tube. The skin is of a brownish-olive above, and white below; and is covered with a number of small, hard granules, with some horny tubercular projections among them. After the brood have left the mother's back, the cells again fill up—the whole process occupying about eight days.

In spite of the repulsive appearance of the creature, the negroes occasionally eat it.

Tortoises.

Tortoises (Testudinata, or Chelonians) belong to a very numerous order of reptiles, the usual form of which is too well known to require description. They are shut up, as it were, in a box and breast-plate: the carapace and plastron, in reality, are external developments of certain parts of the skeleton.

The land tortoises have the strongest plastrons. In some species it is slightly movable, but generally fixed by a uniting suture. In one—the pyxis—the plastron is furnished with a transverse hinge, so that the animal can retract its head and fore-limbs within the carapace, and close the plastron upon it, first shutting them in. In another—the kinixis—the carapace has the posterior portion distinct from the anterior, and movable, so as to shield the hind-limbs and tail.

In water tortoises, or turtles, as they are generally called, the plastron is united to the edges of the carapace by intervening cartilage, and not by suture. The jaws of tortoises are not furnished with teeth, but are cased in horny coverings, resembling somewhat the sharp hooked beak of a parrot; which enable them either to crop and mince the vegetable aliment on which most of them live, or to masticate the small, living animals, such as birds and reptiles, of which the food of others consists. Round the outside of this beak are thick fleshy lips.

In the curious matamata, the jaws of which open very wide, these parts, instead of being armed by a strong beak, are protected by a sheath of horn.

In the land tortoises, the feet are stump-like, the toes being enveloped in the skin, so that they can move but slowly. The marsh and lake tortoises have their feet palmated, to enable them to move either on the water or on land. In the turtles, these limbs appear in the form of broad, flat, undivided paddles, well-adapted for moving in the water, but awkward as instruments of locomotion, even on the level, sandy shores to which they resort at the breeding season.

The tortoise has a fleshy tongue like that of a parrot. The brain is but slightly developed, scarcely filling the cavity of the skull in the marine species. At the same time, the animal possesses great muscular irritability, and extreme tenacity of life. All are

oviparous, and bury their eggs, which are hatched by the warmth of the sun. The water tortoises, when seen below the surface, move like birds in the air, the paddles flapping like wings.

The order is divided into four groups: first, Chersians, or the land tortoises; second, the Elodians, or marsh tortoises; third, the Potamians, or river tortoises; fourth, the Thalassians, or sea tortoises, generally called turtles. These groups are again variously subdivided.

The waters of Tropical America abound with the second and third families. The Elodians, found in the shallow pools of the Amazonian Valley, swim with facility, and move quickly over the ground. They feed not only on vegetables, but prey on living animals—river molluscs, and other water creatures.

The Potamians, which are found in vast numbers in the larger rivers, grow to a great size,—some weighing seventy pounds. They feed much as the last described. They swim with ease, both on the surface and at mid-water. The upper part of the body is generally brown or grey, with regular dotted spots; while the under parts are pale white, rosy, and bluish. When they seize their food, they dart out their heads and long necks with the rapidity of arrows, and bite sharply with their trenchant beaks, not letting go till they have taken the piece out. The females are said to be far more numerous than the males; indeed, Father Gumilla, describing the turtles of the Orinoco, states what might be doubted,—that “in each nest of eggs there is one, larger than the rest, from which the male is hatched. All the others are females.” The eggs are spherical; their shell solid, but membranous or slightly calcareous.

A further description of them will be given when the mode in which they are captured is described. The species, however, deserves particular notice.

The Chelys Matamata.

Grotesque, and unlike what we fancy a reality,—such as those creatures which the wild imagination of the painters of bygone days delighted in producing,—is the curious matamata (*Chelys matamata*), found along the banks of the Amazon, as well as in Guiana. It is covered with armour on the back, neck, and head. On its head it wears what looks like a curiously-shaped helmet, with a long tube in front, which serves as a snout; while its feet are webbed, and armed with sharp claws at the end of its thick,

powerful legs. From the chin hang down two fringe-like membranes, and the throat and neck are similarly ornamented. It is often three feet long; and, from its formidable appearance, it might easily make a stranger eager to get out of its way. This helmet consists of two membraneous prolongations of the skin, which project on either side from its broad and flattened head. A long, flexible, double tube forms its snout. The shield on the back is marked with three distinct ridges, or keels, along it, and is broader before than behind. It has a stumpy, pointed tail.

This curious monster, concealing itself among the reeds on the bank, lies in wait for its prey, darting forward its long neck, and seizing with its sharp beak any passing fish, reptile, or water-fowl; or, should they not come near enough, it swims at a great rate after its prey.

Part 3—Chapter XV.

Wonders of Insect Life.

Termites, or White Ants.

The great ant-eater, dozing during the hot hours of the day within the shady coverts of the forest, sallies forth in the cool of the evening to search for its insect prey on the open Campos. The surface of the ground is there, in many districts, raised into conical hillocks, some five feet in height, and streaked by lines which differ in colour from the surrounding earth, and lead in all directions, over decayed timber and the roots of herbage, from one hillock to the other. These hillocks are the habitations of those curious small pale-coloured and soft-bodied insects called termites, or white ants. They differ very greatly from the true ants in their mode of growth, or metamorphosis, though similar to them in their habits.

The true ant, when emerging from the egg, is a footless grub, and remains in the pupa, or quiescent stage, inclosed in a membrane, till its limbs are developed. The termites at once possess the form they are to bear through life, except that the sexual individuals, during the latter stages of their growth, gradually acquire eyes and wings. They belong, indeed, to two very dissimilar orders of insects. The ant-bear, however, never troubles himself about this matter; but, scraping away with his powerful claws, soon breaks open the citadel which the industrious insects have formed during days of unremitting toil.

The mounds of the termites differ in composition. Some, consisting of earth, are worked into a substance as hard as stone. The coloured lines on the ground mark the covered ways which lead from the places where the insects obtain their food, or the materials for their habitations. The mounds exhibit no openings for egress or ingress. They are often formed by several distinct species of termites, each of which keeps to its own portion of the mounds, and uses different materials. Within the fortress exist a vast number of chambers, with galleries connecting them, composed sometimes of particles of earth, and at others of vegetable matter, cemented by the saliva of the insects. As they live on dry food, and in regions where no water is found, it is supposed that they may possess the power of combining, by vital force, the oxygen and hydrogen of their vegetable food, and thus form water. This supposition, if correct, accounts for the large amount of liquid which they employ in the construction of their cells. The inhabitants of these structures consist of differently formed insects, employed in various distinct occupations. The most numerous are the labourers, who have to toil for the benefit of the community. They are sexless and blind; yet, without the power of sight, they are ceaselessly employed in the construction of these curious mounds, or in taking care of the young, and in collecting and bringing in food for the support of the population. Then come the soldiers, who defend the fortress, or, as more frequently happens, sacrifice themselves for the protection of the rest. The two most important personages of the community are the king and queen, who are the parents of future colonies. These are always found in every perfect termitarium. There are also a large number of winged termites, male and female, who, at a certain period of the year—generally at the commencement of the rainy season—issue forth from the hive into the world. Although a large number are destroyed, a few escape, and, pairing, become the parents of fresh colonies. The formation of a new citadel or colony takes place somewhat in the following manner:—On a mound becoming overstocked, a party of workers, guarded by a body of soldiers, issue forth, and commence a fresh edifice at a distance from the old one. Here they form a large cell in the centre, surrounded by numerous galleries leading to smaller cells. From thence they run their covered ways, in suitable directions, towards spots whence they can obtain their necessary supplies of food and building materials. This being accomplished, they go in search of a royal pair; whom, when they have found, under a leaf or clod of earth, they conduct into the interior cell, where they are installed in due state. The newly-married couple, who have by this time got rid of their wings, are considerably larger than the

rest of the population, but are helpless individuals, having neither the power of working nor fighting. The king soon dies; but his consort, instead of pining for his loss, sets herself to work for the benefit of posterity, by laying a countless number of eggs. As soon as these are deposited the workers carry them off, and place them in the cells, where they watch over them with the most vigilant care, supplying the larvae with food as soon as they are hatched; and when the nursery becomes full, carrying some off in their mouths to another cell. While some are thus employed, others increase the size of their abode by running fresh corridors round the edifice, and forming new cells; while other parties, protected by soldiers, are foraging far and wide for food for the ever-increasing population.

In process of time—always within twelve months—the numberless progeny of the queen become full-grown. Some become developed into labourers, with smooth, rounded heads, and mouths adapted for carrying loads and working up the materials for the construction of their abodes; others—the fighting class—have heads of large size, provided with pointed weapons of defence of various shapes, resembling, in different species, horns, pikes, rams; while others are furnished with powerful jaws, resembling either sabres, swords, or sickles. A third class appear with eyes, and long, delicate wings—gay, happy creatures, far better formed, it would seem, to enjoy existence than their hard-working brethren. These are the males and females of the community. When they are prepared to issue forth from their birth-place, the labourers busily set to work to clear a passage to allow of their speedy egress. This takes place generally on a damp, close evening or cloudy morning. Countless numbers issue forth at intervals, till the whole progeny of males and females have emerged from their pupa state. They make a loud rustling noise as they fly through the air in all directions; but they are immediately set upon by numberless enemies,—goatsuckers, lizards, spiders, and ants,—who greedily eat them up. On reaching the ground they immediately divest themselves of their wings; and the few pairs which escape from their foes seek safety in some hollow beneath a leaf or lump of earth, where they await the arrival of the faithful labourers, who now come forth in search of them, and conduct them, as has before been said, to the newly-formed abode prepared for their reception. And thus the wonderful process goes forward year after year.

So utterly helpless are these males and females, that, were it not for the assistance of other individuals, the race would speedily become extinct. The warrior termites are utterly

regardless of personal safety. When their castle is attacked, they appear in vast numbers at the breach, to cover the retreat of the labourers. As the long tongue of the ant-eater is projected among them, they throw themselves on it; and no sooner is one regiment swallowed up than another rushes out to take its place—thus, by the sacrifice of themselves, enabling the rest of the community to seek safety in flight.

Sauba Ants.

Of the numerous true ants which exist in all parts of Tropical America, the sauba is one of the most remarkable. In all parts of the country—as well near the abodes of man as in the distant wilds—large mounds are seen, two feet in length, and often upwards of forty yards in circumference, and distinguished from the surrounding soil by the difference of colour. Yet these mounds are merely the domes or upper works of the vast subterranean galleries which run for enormous distances and to great depths below the surface. Unlike the termites, the armies go forth in open daylight in vast hordes, to obtain food or materials for the construction of their wonderful habitations. Sometimes, many hundred yards away from these mounds, the whole ground seems covered with animated leaves, each of the size of a sixpence, moving at a steady pace over the ground. Each leaf is held vertically in the mandibles of an ant, which is conveying it for the purpose of thatching the domes which cover the entrance to its subterranean abode; the roof thus formed protecting the cells beneath, rilled with young, from the heavy rains. Going in the direction whence the army is seen coming, we may find a tree covered by innumerable multitudes employed in cutting off leaves. Here the labourers are protected by the warrior class, who appear also to perform the duties of overlookers, and keep them to their tasks. Each ant, on gaining a leaf, commences with its scissor-like jaws to make a semicircular incision on the upper side. It then takes it into its jaws, and detaches it by a sharp jerk. Having done this, it descends to the ground, and joining its comrades, who have been similarly employed, they return with their loads to the colony. Frequently, however, while an ant is up the tree, the piece of leaf falls to the ground, when it sets to work to cut off another; while fresh labourers appear, to carry away the pieces which have thus accumulated.

The sauba ants are greatly dreaded by the inhabitants, as they frequently attack their coffee and orange-trees, and utterly destroy them. Sometimes, indeed, plantations have to be

abandoned in consequence of the inroads of these persevering insects.

The body of the sauba ant is of a pale reddish-brown colour, and of a solid consistency. The head is armed with a pair of sharp spines, while the thorax has three pairs of the same character.

There appear to be three orders of workers among them, greatly differing in size. One order has an enormously large head; the head of another is very highly polished; while that of a third is opaque—to enable it, apparently, to perform the duties of a subterranean labourer. The earth of which the domes of the sauba ants are composed is brought up from a considerable depth below. There are numerous entrances leading to the galleries, but, under ordinary circumstances, they are kept closed. The smaller galleries lead, at a depth of several feet, to a broad, elaborately-worked tunnel of four or five inches in diameter, which conducts downwards to the centre chamber; the abode of the royal pair, on whom devolves—as is the case with the termites—the duty of propagating the species. Here they are guarded much in the same way by the labourers, who deposit the eggs in the cells, and finally assist in the exit of the winged males and females—which fly forth to be destroyed in vast numbers, the few who remain becoming the parents of other families.

The female winged ants are of considerable size, measuring fully two and a quarter inches across the wings. The male is very much smaller.

The royal chamber is curiously constructed. As soon as the newly-wedded pair are conducted within, the workers, who are themselves much smaller, so diminish the size of the entrance that it is impossible for the king and queen to escape. Round it are numerous exits and entrances, through which the workers convey the eggs when laid. The queen, after the death of her consort, lives for two or three years, employed during the whole of the time in laying eggs, at the rate of fifty in a minute. This will give some idea of the rapid increase of the population.

The workers vary somewhat in size and appearance. While a large number are employed in bringing in leaves and granules of earth for thatching their domes, as well as various sorts of provision, others are engaged in tending the royal chamber—carrying the eggs to the cells, and watching over the young. There is another class, whose heads are covered with hairs, and

who appear to be employed entirely below ground, probably as excavators or tunnellers.

Like the Cyclops, they have in the centre of their forehead a single eye, very different in structure to the compound eyes on the sides of their head. The other workers do not possess this peculiar frontal eye, nor is it found in any other species of ant.

It is wonderful what extensive tunnels these ants will form. Near Rio de Janeiro a tunnel was discovered, excavated by the creatures under the River Parahiba, as broad as the Thames at London Bridge. Near Para they, on one occasion, pierced the embankment of a large reservoir to such an extent as to allow the escape of a vast body of water before the damage could be repaired. In the same neighbourhood an attempt was made to destroy their colonies, by blowing fumes of sulphur down the galleries by means of bellows. Mr Bates relates, that he saw smoke issuing from a vast number of outlets, one of which was seventy yards distant from the place where the bellows were used.

They wander to a great distance in search of plunder, and enter houses for the purpose of carrying off the farina or mandioca meal. The same naturalist relates that he was one night awoken by his servant telling him that rats were robbing the farina baskets. On listening, he was certain that the noise was unlike that made by rats. On going to the storeroom he there found a broad column of sauba ants, consisting of thousands of individuals, passing to and fro between the door and his baskets of meal. Most of those passing outwards were loaded each with a grain of farina, larger and many times heavier than the bodies of the carriers. The baskets, which were on a high table, were entirely covered with ants, many hundreds of whom were employed in snipping the dry leaves which served as a lining; and this had produced the rustling sound which had disturbed him. He and his servant in vain attempted to exterminate them by killing them with their wooden clogs. Fresh hosts came on to take the place of the slain. The next night they returned, when he attempted to get rid of them by laying trains of gunpowder along their line to blow them up. Not, however, till he had repeated this operation several times, did the survivors of the daring depredators retreat.

The Amphisbaena.

A curious snake, with something the character of the English slow-worm, the amphisbaena—called by the natives Mai das

Saubas, or the mother of the saubas—is frequently found in these mounds. The natives believe that the ants treat it with great affection, and will, if the snake is removed, leave the spot. It is probable, however, that the *amphisbaena* takes up its abode in the nest for the convenience of devouring the inhabitants, whenever unable to procure other food.

Some of the American ants are of great size. One species (the *Dinoponera grandis*) is an inch and a quarter in length, and proportionally stout. It is seen marching in single file through the forest; but though of considerable size, its sting is not severe, while there is nothing particularly interesting about its habits.

Ecitons.

There are, however, several species of foraging ants, called ecitons, which move in vast bodies through the forest in search of prey. They are carnivorous, and attack not only insects and grubs of all sorts, but even other ants,—assaulting their citadels and carrying off the slaughtered inhabitants. The natives, when they meet them in the forest, hurry out of their way, to avoid their fierce attacks. Their communities appear to be composed, besides males and females, of two classes of workers, one with head and jaws very much larger than the others.

One species of these foraging ants is known as the *Eciton rapax*, the larger workers among which are half an inch in length.

The two common species of ecitons are, *Eciton hamata* and *Eciton drepanophora*, which are very similar in their habits and appearance.

They are of the most pugnacious character, and a person incautiously getting in their midst finds himself furiously attacked. They climb up his legs, and, holding on by their pincer-like jaws, double in their tails, and sting with all their might. The natives, on seeing them, cry out, “Tauoca”—the name which they give to the ecitons—and scamper off to a distance. The only way of getting rid of them is to pluck them out one by one; but so securely do they fasten themselves to the skin, that their head and jaws are left sticking to it.

As they advance through the forest, the creatures on which they prey endeavour to get out of their way; but vast numbers of maggots, caterpillars, larvae, and ants of other species fall

victims to their ferocity. They advance in a long column live or six deep, while thinner columns forage on either flank, till they arrive at a mass of rotten wood abounding in insect larvae, when they surround it, and do not again move forward till every particle of food has been carried off!

When they discover a wasp's nest, they attack the papery covering to get at the larvae pupae and newly-hatched wasps. In spite of the rage of the parents, who vainly keep flying about them, they carry off their spoil in fragments; the carriers having their loads apportioned to their size—the dwarfs taking the smaller pieces, and the stronger fellows the heavier portions. Sometimes two ants join in carrying one piece.

Robber Ecitons.

Another species (the *Eciton legionis*) has been known to attack other ants' nests for the sake of plunder. Mr Bates saw an army of them employed on the face of an inclined bank of earth. They were excavating mines to get at the nest of a larger species of ant of the genus *Formica*. Some were rushing into the passages, others were seen assisting their comrades to lift out the bodies of the *formicae*, while others were tearing them in pieces—their weight being too great for that of a single eciton. A number of carriers then seized each a fragment and carried it down the slope. When the naturalist dug into the earth with a small trowel, the eager freebooters rushed in as fast as he excavated, and carried off the ants, so rapidly tearing them in pieces that he had great difficulty in rescuing a few entire specimens.

The little ecitons seemed to be divided into parties, some excavating, others carrying away the grains of earth. When the shafts became rather deep, the mining parties had to climb up the sides each time they wished to cast out a pellet of earth; but their work was lightened by their comrades, who stationed themselves at the mouth of the shaft and relieved them of their burdens, carrying the particles to a sufficient distance from the edge of the hole to prevent them rolling in again. All the work seemed thus to be performed by intelligent co-operation among the host of eager little creatures. Still, there was not a rigid division of labour; for some of them, whose proceedings he watched, acted at one time as carriers of pellets, and at another as miners, and all shortly afterwards assumed the office of conveyers of the spoil. In about two hours, all the nests of the *formicae* were rifled.

He frequently saw these little creatures engaged apparently in play, in the neighbourhood of their homes. Some were walking slowly about, others were brushing their antennae with their fore-feet; but the drollest sight was to see them cleaning one another. Here and there an ant was seen stretching forth first one leg, then another, to be brushed or washed by one or more of its comrades; who performed the task by passing the limb between the jaw and the tongue, finishing by giving the antennae a friendly wipe.

There are two species of blind ecitons—which, however, go on foraging expeditions, and even attack the nests of other stinging species; but, avoiding the light, they move always under leaves and fallen branches: when the columns have to pass a cleared space, the ants form covered ways with granules of earth, arched over and holding together mechanically.

Blind Ants.

Two other species—*Eciton vastator*, and *Eciton erratica*—both of which are blind, move entirely under covered ways in search of promising hunting-grounds. Their arcades are sometimes two hundred yards in length, the grains of earth being taken from the soil over which the column is passing, and fitted together without cement. In this they are distinguished from the covered ways made by the termites, who use a glutinous saliva for cementing their edifices. These blind ecitons build up the side of their convex arcade, and in a wonderful manner contrive so to fit in the key-stones, without allowing the loose uncemented structure to fall to pieces. Whenever a breach is made in any of their covered ways, the workers remain behind to repair the damage, while the soldiers issue forth in a menacing manner, rearing their heads, and snapping their jaws with an expression of fiercest rage and defiance.

The above account will give some idea of the vast numbers and varieties of the termites and ants of this region, and of the wonderful way in which Providence has furnished them with the means of sustaining existence, and taking their part in the economy of nature. Science is deeply indebted to Mr Bates, for his persevering efforts and acute observation in making known the varieties and habits of these curious insects.

Centipeds—Cockroaches—Fire-Ants.

Although the rest of the animal creation is small compared with the creatures of the Eastern world, insects and reptiles attain a

size which will vie with those of any portion of the globe. Here we have a centiped nearly a foot in length, with innumerable legs, and two horns or feelers, which it protrudes with the most venomous expression. These animals are not only hideous to look on, but their bite is very painful, though not dangerous.

Cockroaches swarm everywhere; but the fire-ant is, for its size, probably the most terrible of created beings. Its bite produces the most acute pain; and where they swarm, on the dry sandy shores of the streams, they frequently compel the natives to desert their villages. Mrs Agassiz mentions having on one occasion hung some towels to dry on the cord of her hammock, and was about to remove them, when suddenly her hand and arm seemed plunged into fire. She dropped the towels as if they were hot coals, which for the moment they literally seemed to be. She then saw that her arm was covered with little brown ants. A native brushed them off in all haste; and an army of them was found passing over the hammock, and out of the window, near which it hung. He said they were on their way somewhere, and if left undisturbed would be gone in an hour or so.

Insects—Fire-Flies.

Of those diamonds of the night, the fire-flies and fire-beetles, there are numerous species. One of the most abundant—and of much larger dimensions than the rest of the elaters or beetles—*pyrophorus noctilucus*, called by the natives *cocuja*, displays both red and green light. On the upper surface of the thorax there are two oval tubercles, hard and transparent, like bull's-eye lights let into a ship's deck. These are windows out of which shine a vivid green luminousness, which appears to fill the interior of the chest. Then on the under surface of the body, at the base of the abdomen, there is a transverse orifice in the shelly skin, covered with a delicate membrane, which glows with a strong ruddy light; visible, however, only when the wing-cases are expanded. It is about an inch and a half long, of a brown colour, and has a strong spine situated beneath the thorax, which fits at pleasure into a small cavity on the upper part of the abdomen. By means of this machine it can, when placed on its back, spring up a couple of inches, and regain its feet. When preparing to do this it moves its head and thorax backwards, so that the pectoral spine is drawn out and rests on the edge of the sheath. The same backward movement being continued, the spine, by the full action of the muscles, is bent like a spring, and the insect at this moment rests on the extremity of its head and wing cases. The effort being suddenly

relaxed, the head and thorax fly up, and in consequence the base of the wing-cases strike the supporting surface with such force that the insect by the reaction is jerked upward, while the projecting points of the thorax and the sheath of the spine serve to steady the whole body.

So brilliant is the light of these creatures, that even one moved over the print of a book will enable a person to read by it, while eight or ten placed in a clear glass bottle serve the purpose of a lamp. The Brazilian ladies ornament their dresses with these fire-beetles, by securing them so as not to injure the creatures; while they frequently wear several in the braids of their dark hair, which, when they walk abroad in the evening, has a curious and beautiful effect. (Gosse and Darwin.)

Prescott relates that when the Spaniards first invaded America, on seeing the air filled with *cocujas* during the darkness of night, their excited imaginations converted them into an army with matchlocks, and they waited, expecting to be attacked by an overwhelming force. A similar story is told of the British, when first landing in the West Indies, being induced to hastily re-embark on seeing at night innumerable lights moving about, which they supposed were Spaniards approaching to defend the shore.

Suspended Cocoons.

The forests of Brazil exhibit numerous beautiful examples of insect workmanship. Among others is the work of a caterpillar—a cocoon about the size of a sparrow's egg, woven in broad meshes of either buff or rose-coloured silk, and seen suspended from the tip of an outstanding leaf by a strong thread, five or six inches in length. It forms a conspicuous object hung thus in mid-air. The glossy threads with which it is knitted are stout, and the structure is not likely therefore to be torn by the beaks of insectivorous birds; while its pendulous position makes it doubly secure against their attacks, as the apparatus gives way when they peck at it. There is a small orifice at each end of the egg-shaped bag, to admit of the escape of the moth when it changes from the little chrysalis which sleeps tranquilly in its airy cage.

Other caterpillars form cases with fragments of wood or leaves, in which they live secure from their enemies, whilst they are feeding and growing. Some of these, composed of small bits of stick, are knitted together with fine silken threads, and others make tubes very like the *cadis-worms* of English ponds. Others

choose leaves, with which they form an elongated bag, open at both ends, having the insides lined with thick webs. As the weight of one of these dwellings would be greater than the caterpillar inside could sustain, it attaches the case by one or more threads to the leaves or twigs near which it is feeding.

Lantern-Fly.

There is a large and beautiful insect, with an enormous transparent prolongation of the forehead, which is supposed to have a resemblance to a lantern: it is called the lantern-fly (*Fulgora laternaria*). Though often described as possessing luminous properties, it is now known to be destitute of any phosphorescence whatever.

The Tanana.

(*Chlorocelus tanana*.)

Often through the woods a loud, sharp, resonant stridulation is heard, sounding like the syllables "Ta, na, na," succeeding each other with little intermission. It is produced by a species of wood cricket, called by the natives after the sound it produces. The total length of the body is two inches and a quarter when the wings are closed. The insect has an inflated bladder-like shape, owing to the great convexity of the thin, firm, parchmenty wing-cases; the little creature being of a pale green colour. The instrument by which it produces its music is contrived out of the ordinary nervures of the wing-case. In each wing-case the under edge of the wing itself has a horny lobe. On one wing this lobe has a sharp raised margin, on the other the strong membrane which traverses it on the under side is crossed by a number of fine and sharp furrows like those of a file. When the insect rapidly moves its wings, the file of the one lobe is scraped sharply across the horny margin of the other, thus producing the sounds; the parchmenty wing-cases and the hollow drum-like space they enclose assisting to give resonance to the tones. These notes are the call notes of the males, inviting a mate to his burrow. (Bates.)

Wood Beetles.

Enormous as are the trees of the Amazonian forests, and able to withstand the fiercest storms, they have frequently to succumb to the attacks of minute insects. Many a monarch of the woods has been brought low by the efforts of the persevering termites; but they have other enemies. The palm-

trees are assailed by a group of beetles (the Histeridae) which take possession of the moist interior of their stems. One of these is an enormous fellow—the hister maximus. Another group have their bodies as thin as wafers, to enable them to live in the narrow crevices of the bark. One set of species, however (the trypanaeus), are totally different, being cylindrical in shape. They drill holes in the solid wood, and look like tiny animated gimlets when seen at work; their pointed heads being fixed in the wood, while their smooth glossy bodies work rapidly round so as to create little streams of sawdust from the holes.

The caribi, which in Europe perform the important duty of scavengers, and live on the ground, are in South America nearly always found on trees. Some are of enormous size.

The Hercules beetle, which lives on the mamma Americana, attains a length of five and sometimes six inches. It is known by the singular horn-shaped proboscis rising from the head and thorax, which gives it so formidable an appearance. Its duty is probably to eat up the rotten wood.

Other members of the family,—known as the elephant, Neptune, and typhon,—excavate burrows in the earth, living on the decomposed trunks of trees during the day, and flying about at night with a loud humming noise—apparently to enjoy the air, of which they are deprived in the daytime.

The megasominae is of an enormous size, as is also the beautiful Inca beetle.

Among the most beautiful beetles in the Brazils is the diamond beetle (*Entrinus nobilis*), of a lustrous azure green, and with golden wings. With it, and other species, the ladies form necklaces, and ornament their dresses.

In Venezuela, the cactus plants, which grow so abundantly, serve to nourish the valuable though odd-looking little coccus cacti. The male and female differ greatly. The female resembles a Lilliputian tortoise, and is of a dark brown colour, with two light spots on the back covered with white powder. The male, possessed of a pair of wings, is much smaller, and roves about at will from plant to plant. The female, a short time after she has become full-grown, secures herself to a leaf, where she remains immovable. She now grows to such a size, that she more resembles a seed belonging to a plant than an insect, all her limbs being completely concealed by her wide-expanded body. In process of time, before the young insects are born, the cochineal-gatherers detach the insect by means of a knife

dipped in boiling water, which kills them. They are then dried in the sun, and appear like small dry berries of a deep mulberry colour.

Spiders.

Fear-inspiring is the appearance of the great crab-spider—the *Mygale avicularia*, one genus of the formidable *Arachnida* family—with a body two inches in length, and, when the legs are expanded, seven inches across, covered entirely with coarse grey, reddish hairs. It lives among the rocks in the drier regions; some dwell under stones, others form artistic tunnels under the earth, and some build their dens in the thatch of houses. Bates one day saw some Indian children with one of these monsters secured by a cord round its waist, by which they were leading it about the house as they would a dog. The hairs with which it is covered come off when touched, and cause a peculiar and almost maddening irritation. This is, however, probably owing to their being short and hard, and thus getting into the fine creases of the skin, and not to any poisonous quality residing in the hairs. These monstrous spiders prey on lizards, small birds, and other diminutive vertebrates. Their muscular power is very great. When the creature is about to seize its prey, it fixes its hind-feet firmly in the ground, and lifting up the front ones, darts them forward, and fastens them with the double hooks which terminate its feet between the cranium and the first vertebra, thus preventing the possibility of their escaping. Nothing will then tear it from its prey. When pressed by hunger, it climbs at night the trees and shrubs in which humming-birds and other small birds are perched, or have built their nests, and springing on them, grasps them with its powerful claws. It seizes the anolis, a kind of water-lizard, in the same way. The fact of its seizing on birds, so long doubted, though asserted by Madame Marian, the French naturalist, has been corroborated by Monsieur Jonnes, her countryman. He states that it spins no web to serve it as a dwelling, but burrows and lies in ambush in the cliffs and hollow ravines. It often travels to a considerable distance, and conceals itself under leaves, thence to dart out on its prey; or it climbs along the branches of trees to surprise the humming-birds and other small tree-creepers. Bates still further settles the point.

With regard to the habits of another species which does spin a web, he says that, catching sight of one of these spiders, he was attracted by its movements. It was in the crevices of a tree, across which was stretched a dense web. The lower portion of the web was broken, and two small birds,—finches,—

were entangled in the pieces. They were the size of the English linnet, and probably male and female. One was quite dead, the other lay dying under the body of the spider, and was smeared with the filthy liquor or saliva exuded by the monster.

The mygale carries its eggs enclosed in a cocoon of white silk of a very close tissue, formed of two round pieces uniting at their borders. It supports this cocoon under its corselet by means of its antennulae, and transports it along with itself. When hard-pressed by its enemies, it abandons it for a time, but returns to take it up as soon as the combat is concluded. Nearly two thousand eggs are contained in these cocoons.

The young ones when they appear are entirely white, gradually assuming the colour of the adult.

The falces, or reaping-hook claws, of the great crab-spider are of enormous size, and are sometimes set in gold and used as toothpicks, from the idea that they possess some medicinal virtue to cure the toothache.

The different species vary very much in their habits. One big fellow—the *Mygale Blondii*—forms a broad slanting gallery about two feet in length, the sides of which he lines beautifully with silk. Just before sunset he may be seen keeping watch near the mouth of his tunnel, disappearing suddenly when he hears a heavy foot-tread near his hiding-place.

Many are of the most showy colours. Some double themselves up at the base of leaf-stalks, so as to resemble a flower, and thus deceive the insects on which they prey. One of the most extraordinary in appearance—the *Arosoma arcuatum*—has two curved, bronze-coloured spines, an inch and a half in length, proceeding from its abdomen. It spins a large web, those huge spikes apparently being no impediment to its work.

Bees and Wasps.

Bees and wasps of a countless number of species abound in every region of the continent. Some build their habitations, composed of a papery substance, attached to the under side of the broad leaves of the tucuma and other palms. Others, again, form them in hollow trees, or among their roots in the earth. Many build in houses, or pierce their mud walls till they look as if riddled with shot. Others make holes in the ground, especially in sandy places. Others, again, construct their habitations of clay, and fasten them to the boughs of trees or to buildings.

There are, indeed, mason bees, carpenter bees, and miner bees and wasps.

Watch the little, pale green bombex, or sand-wasp, at work, throwing out with its fore-feet jets of sand from the hole it is forming in the sloping bank. In a wonderfully short time the female miner has formed a gallery two or three inches in length. Out she backs, making a few turns round the entrance to admire her work—or, probably, to take note of the locality—and then away she flies. She may be absent for a few minutes, or perhaps for an hour, according to her success in hunting. At length back she comes with a big fly in her grasp, benumbed by her sting. She carries it in, lays an egg in the body, which will serve as food for the soft footless grub soon to be hatched, and then closing the entrance, sets to work to form a new nursery like the first, which she will furnish in the same careful manner. It is curious how she can find her way back, for often she has to go half a mile before she can find a fly to suit her purpose.

Another species,—the *Monedula signata*,—as large as a hornet, is particularly useful in carrying off the teasing flies, the bloodthirsty motucas, which buzz round the voyager on the Amazon when at anchor near a sand-bank. Bates was rather startled by seeing one fly directly at his face, on which it had espied a motuca, and which it carried off, holding it tightly to its breast.

The pelopaeus wasp builds a nest of clay, shaped like a pouch, two inches in length, and attaches it to a branch. It forms the clay in little round pellets, kneading it with its mandibles into a convenient shape, and humming cheerfully while engaged in its work. On arriving with the ball of moist clay it lays it on the edge of the cell, and then spreads it out round the circular rim by means of the lower lip, guided by the mandibles—sitting astride while at work. On finishing each addition it takes a turn round, patting the sides with its feet inside and out, before flying off for a fresh pellet. It feeds on small spiders, which it reduces to a half dead state by its sting, thus to serve as food for its progeny.

One bee,—the *Trypoxylon aurifrons*,—builds a nest of clay like a squat round bottle or carafe; generally in rows, one beside the other, on a branch, or in the corners of a building.

The melipona bees are the most numerous of the honey-producing insects, their colonies being composed of vast numbers of individuals. They are smaller than the English hive-bee, and have no sting. The workers collect pollen as do other

bees, but a great number are employed in gathering clay for forming walls as an outer protection to their nests. They first scrape the clay with their fore-mandibles, passing it on to the second pair of feet, and then to the large foliated expansions of the hind-shanks, patting it in the process, till the little hodsman have as much as they can carry, when they fly off with their loads to their nests. One species builds a tubular gallery of clay of a trumpet shape at the mouth. Here a number of the pigmy bees are stationed to act the part of sentinels.

Thus the melipona bees are masons as well as workers in wax and pollen gatherers. Although they have no sting, they defend their habitations, and bite furiously when disturbed. Bates found forty-five species of these bees in different parts of the country, and one hundred and forty of other species. Several of them were attended by drones, which deposit their ova in the cells of the working bees, some of them having the dress and general appearance of their victims.

Butterflies.

This is a region of magnificent butterflies. In the neighbourhood of Para alone seven hundred species have been found. Many seldom leave the shady paths which pierce the forests; others, however, occasionally come forth into the broad sunlight and more open glades. See the slender *Morpho menelaus*, with splendid metallic blue wings seven inches in expanse, flapping them as does a bird as it flies along.

Far surpassing it, however, is the *Morpho rhetenor*; which, conscious of its beauty, revels in the sunlight, but seldom ventures nearer than twenty feet from the ground. So dazzling a lustre have the upper wings of this butterfly, that when it flaps them occasionally, and the blue surface flashes in the sunlight, it may be seen a quarter of a mile off.

Another species of the same genus has a satiny white hue; but, infinite as they are in number, so most diversified are they in their habits, mode of flight, colours, and markings. Some are yellow, others bright red, green, purple, and blue. Many are bordered or spangled with metallic lines and spots of a silvery or golden lustre. Some have wings transparent as glass.

One of these (the *Hetaira esmeralda*) is especially beautiful, having an opaque spot on its wings, of a violet and rose hue; and as this is the only part visible when the insect is flying low over the dead leaves of the darker recesses of the forest—

where it is alone found—it looks like the wandering petal of a flower.

Of moths, too, there are great numbers,—among them, the *Erebus strix*, the largest of its family, sometimes measuring nearly a foot in expanse of wing. In the open sunny spots the bright air is often alive with superb dragonflies. Upwards of one hundred species are found near Para. Some live only in the gloom of the forest. Often, however, they are the most beautiful, being more brightly coloured and delicate in construction than the others. Many delight to flit over the igarapes and calm pools.

Among these, the *Chalcopteryx rutilans* has four wings, each transparent,—while the hind-wings, of a dark colour, glitter with a violet and golden effulgence. They all wage unceasing war against the day-flying insects. When one is captured, the dragon-fly retires to a tree, and there, seated on a branch, devours the body at its leisure. It is wonderful the number of flies which these beautiful insects destroy. When evening comes on they eagerly fly off to the chase, amid the swamps and around the tree-tops, or wherever their victims congregate.

Part 3—Chapter XVI.

Wonders of the Forest.

Of the palms alone, upwards of a hundred species are found in these forests. These supply the Indian with nearly all he wants to support existence. Their fruit, or pith, or crowns, furnish him with an abundance of food. He builds his hut and floors it with their wood, and thatches it with their leaves. From the trunks of some species he forms his canoes, of different sizes. He obtains from them oil, cord, thread, wine—or a beverage which answers the purpose—wax, mats, baskets, arrows for his sumpitan or bow, and numberless other articles. Pure, clear oils are made from some of the nuts and palm fruits; while many palms yield a fibrous material admirably suited for cordage, being singularly elastic and resistant.

From the curious candella-tree,—called by the Spaniards *arbol de la manteca*, by the Indians *cuajo*,—he obtains tallow for candles and excellent oil for lamps, and a beverage which is made from its fruit.

The cow-tree supplies a milk in appearance like that of the animal from which it takes its name, but thicker. On analysing this product, it is found to consist of water, animal milk, and wax as pure as that obtained from bees. By dipping cotton in the liquid, too, candles can be made.

In the hotter regions grows the *bajuco d'agua*, which supplies the place of wells and fountains,—each yard of it affording a pint of water. High up on the mountainside, in the regions of icy wastes, called the *paramos*, grows the *frailejou*, which yields a pure turpentine, and assists to warm the human body. Of the palms, a few only can be described. There is the cocoa-nut palm, with its swollen bulb-like stem when young, its tall straight trunk when full-grown, its cluster of heavy fruit, its long plume-like drooping flower; the *coccoeiro*, with its slighter trunk and pendent branches of small berry-like fruit; the *palmetto*, with its tender succulent bud on the summit of the stem, used as a vegetable, and proving an excellent substitute for cabbage; the thorny *icari*, or *cari*—a variety of fan-palm. Its spiny stems and leaves, which cut like razors, make it difficult to approach. Its bunches of bright chestnut-brown fruit hang from between the leaves which form its crown, each bunch about a foot in length, massive and compact, like a large cluster of black Hamburg grapes.

The *syagrus* palm has a greenish fruit, not unlike the olive in appearance, which hangs in large pendent bunches just below the leaves. The fruit resembles somewhat that of the bread-tree, but is more slender and cylindrical in form.

The leaves of different kinds of palms are used for thatching the Indian huts, the *curua* palm among others. When young, they grow closely round the mid-rib attached to the axis by a few fibres only, so that when the mid-rib is held up they hang from it like so many straw-coloured ribbons. With these leaves both the walls and roofs are covered. The mid-rib, which is strong, and sometimes four or five yards long, is set across to serve as a support, and bind down the pendent leaves. Such a thatch will last for years, and is an excellent protection from rain as well as sun.

The Indian furnishes himself with cups and vessels of all sorts from the *cuieira*-tree (*Crescentia cajeput*). It is of immense size, the fruit being like a gourd. It is spherical, of a light green shining surface, and grows from the size of an apple to that of the largest melon. It is filled with a soft white pulp, easily removed when the fruit is cut in halves. The rind is then allowed

to dry. Cups and basins of various sizes are made from it, which the Indians adorn with a variety of brilliant colours.

One of the staple productions of the Upper Amazon is the guarana. It is a trailing plant, a sort of vine; when full-grown, about eight feet high, and bearing a bean the size of a coffee-bean, two being enclosed in each envelope. This bean, after being roasted, is pounded in a small quantity of water till it becomes compact, and, when dry, is about the colour of chocolate. It is then grated with the rough tongue of the piraracu, and when mixed with sugar and water makes a refreshing beverage. It is said to have an excellent effect when administered in cases of diarrhoea.

Aspects of the Forest.

Although at some times of the year the forests present only varied tints of green and brown, unrelieved by brighter colours; at others, when, after the rains, nature has revived, the banks of the streams are gay and beautiful in the extreme. Thousands of brilliant blossoms of varied colours rise amid the trunks of the trees, or hang in rich festoons from the branches, while the air is laden with the almost overpowering perfume of numberless flowers.

"Wild flowers," says Mrs Agassiz, "are abundant; not delicate small plants growing low among the moss and grass, but large blossoms covering tall trees, and resembling exotics at home by their rich colour and powerful odour—indeed, the flowers of the Amazonian forests reminded me of hot-house plants—and there often comes a warm breath from the depth of the woods laden with perfume, like the air from the open door of a conservatory."

"Beautiful as are the endless forests, however," she remarks in another place, "we could not but long, when skirting them day after day, without seeing a house or meeting a canoe, for the sight of tilled soil, for pasture lands, for open ground, for wheat-fields and hay-stacks; for any sign, in short, of the presence of man. As we sat at night in the stern of the vessel, looking up the vast river stretching many hundred leagues, with its shores of impenetrable forests, it was difficult to resist an oppressive sense of loneliness. Though here and there an Indian settlement or a Brazilian village appears, yet the population is a mere handful in such a territory."

Wonderful is the change in the appearance of the tropical representatives of well-known families in the Old World.

The india-rubber tree belongs to the milk-weed family. The euphorbiaceae assume the form of colossal trees, constituting a considerable part of its strange and luxuriant forest growth. The giant of the Amazonian woods, whose majestic flat crown towers over all other trees, while its white trunk stands out in striking relief through the surrounding mass of green—the sumaumera—is allied to the mallows of the North. Some of the most characteristic trees of the river-shore belong to these two families.

Buttress Trees.

One of the most striking characteristics of the forest vegetation is the way in which many of the trunks of the trees are supported by buttresses. The huge sumaumera is especially remarkable; but this disposition to throw out supports is not confined to one tree. It occurs in many families. These buttresses start at a distance of about ten feet from the ground, separating greatly towards the base, where they are often ten to twelve feet in depth. The lower part of the trunk is thus divided into several open compartments, so large that, if roofed over, they would form a hut with sufficient space for two people to stand up or lie down in. Others, however, rise to the height of twenty or thirty feet, and run up in the form of ribs to forty or fifty feet. Other trees appear as if they were composed of a number of slender stalks bound together, and are ribbed to their entire height. In some places the furrows reach completely through them, and appear like the narrow windows of a tower. The stems of others again rise on the summit of numerous roots, like the bulging-stemmed palm, apparently standing on a number of legs at the height of a dozen feet or more from the ground. Often the roots thus form archways sufficiently large for a person to walk beneath.

Sipos or Wild Vines.

Circling round the stems of trees in innumerable coils, and grasping them with a deadly embrace, grow in rich luxuriance countless wild vines, well meriting the name of murdering sipos. They hang in festoons from their boughs, and form an intricate tracery of network from tree to tree,—often of sufficient strength to support the falling monarchs of the forest when time has wrought decay among their roots.

Here are seen tillandsias and bromeliaceae, like the crowns of huge pineapples; large climbing arums, with their dark green and arrow-head shaped leaves, forming fantastic and graceful ornaments swinging in mid-air; while huge-leaved ferns and other parasites cling to the stems up to the very highest branches. These are again covered by other creeping plants; and thus we see parasites on parasites, and on these parasites again. As we gaze upwards, we see against the clear blue sky the finely divided foliage, many of the largest of the forest-trees having leaves as delicate as those of the trembling mimosa: among them appear the huge palmate leaves of the cecropias, and the oval glossy ones of the clusias, countless others of intermediate forms adding to the variety of its scenery,—the bright sunshine playing on the upper portion of the foliage, while a solemn gloom reigns among the dark columns which support this wondrous roof of verdure.

In truth, in these woods a thousand objects attract the eye, each a world of varied vegetation in itself; while the ear listens to the quick rustling breeze moving the palm-leaves fifty feet or more above the head,—not like the slow gathering, rushing wind among the pine-trees in northern climes, but like rapidly running water. Now an immense butterfly of the most vivid blue comes sailing by to alight on a neighbouring shrub, when, suddenly folding his azure wings out of sight, it looks merely like some brown moth spotted with white.

As evening comes on, in some districts a strange confusion of sounds is heard, as from a crowd of men shouting loudly at a distance. Now it seems like the barking of dogs, then like that of many voices calling in different keys, but all loud, varied, excited, full of emphasis; and yet, after all, the rioters are but the frogs and toads uttering their usual notes.

The Seringa or India-Rubber Tree.

Along the whole extent of the submerged region on the banks of the Amazon, beginning at a distance of about fifty miles from Para, as well as on the shores of many of its tributaries, grows a tree with bark and foliage not unlike that of the European ash. The trunk, however, shoots up to an immense height before throwing off branches. It is the valuable sering-tree (*Siphonia elastica*), belonging to the family Euphorbia, which produces india-rubber. As soon as the waters after the rainy season have subsided, the natives go forth in parties to procure the sap with large bowls, clay moulds, pans in which to collect it, and axes for cutting the wood for their fires. They build their huts in the neighbourhood of the trees.

The first business is to make gashes in the bark, keeping them open by pegs, under which they place little clay cups, or shells. Each person has a certain number of trees under his charge. Every morning he goes round, and pours what has collected in the cups into a large bowl. The sap is at first of the consistency of cream, but it soon thickens. The moulds, which are generally in the form of bottles, are then dipped into the liquid. As soon as the coating is dried, the mould is again dipped in, and the same process is gone through for several days. The substance is at this time hard and white. Meantime fires are made with the nuts of several species of palms—the inaja and others. These produce a thick black smoke. The india-rubber is then passed several times through it. By this means a dark colour and the proper consistency are obtained. The moulds being broken, the clay is poured out, and the material is ready for the market.

Sometimes it is formed in large flat pieces; and of late years it has been preserved in a liquid state in hermetically closed vessels.

The seringa-tree differs greatly from the group of plants which furnish the caoutchouc of Africa and the West Indies; the latter being the product of certain species of ficus of a climbing character, and inferior to the india-rubber of South America.

The Cow-Tree.

Among the noblest of the forest monarchs appears a tree with deeply-scored reddish and ragged bark. Who would have supposed that from that vast trunk would issue a milky liquid scarcely distinguishable at first from that of the cow? Yet such is the sap coming from the opening made by the axe from the massaranduba or cow-tree. When fresh it serves every purpose of real milk when mixed with coffee; but drunk pure has a somewhat coarse taste—and it is considered dangerous to drink much of it, however refreshing a small quantity may be. It soon thickens, and forms a tenacious glue, which can be usefully employed in cementing crockery. A decoction of the bark is employed as a red dye for cloth. The fruit, also, is largely consumed; while the wood is excessively durable in water.

Monkeys' Drinking-Cups—Brazil-Nut Tree.

Two lofty trees, closely allied to each other—the *Lecythis ollaria* and the *Bertholletia excelsa*—produce enormous capsules full of nuts. The first, called the sapucaya, yields these curious capsules known as *cuyas de maccao*, or monkeys' drinking-

cups. At the top is a circular hole, to which a natural lid fits exactly. On the nuts becoming ripe the lid is loosened, and the heavy cup falling to the ground, the nuts are scattered far and wide, when they are eaten by numerous animals on the watch for them. The collectors, therefore, have difficulty in obtaining them. The other tree, known as the Brazil-nut tree, produces similar wooden vessels; but as they have no lid, they fall entire to the ground, and are thus preserved till human beings come to collect them, when they are shipped to England and other parts of the world.

The Victoria Regia.

On the surface of the tranquil pools, amid the recesses of the forest, float the wide-spreading circular leaves of the magnificent Victoria regia, like vast dishes—their edges turned up all round—with beautiful flowers rising amid them. The colour varies from the velvety white outer petals through every shade of rose to the deepest crimson, and fading again to a creamy yellowish tint in the heart of the flower. The natives call it the *forno do piosoca*, or oven of the jacana—the leaves being like that of the baking-pans, or ovens, on which the mandioca meal is roasted. The leaf rises from the root at the bottom of the pool, on a stock armed with sharp spines.

When young, the leaf may be seen in the form of a deep cup or vase surrounded with ribs, at that time comparatively small, the whole green expanse of the adult leaf covered in between them in regular rows of puffings. As the ribs grow their ramifications stretch out in every direction, the leaflets one by one unfolding to fill the ever-widening spaces; till at last, when it reaches the surface of the water, it rests horizontally above it without a wrinkle—the colossal leaf being thus supported by a heavy scaffold of ribs beneath it, sufficient not only to support the light-stepping jacana, but even a young child. Some of the leaves have a diameter of from four to five feet; some may grow even to a larger size.

"Here, seen in its own home, it has in addition to its own beauties the charm of harmony with all that surrounds it," observes Mrs Agassiz,—“with the dense mass of forest, with palm and parasite, with birds of glowing plumage, with insects of all bright and wonderful tints, and with fishes which, though hid in the water beneath it, are not less brilliant and varied than the world of life above.”

Palms.

Almost countless are the varieties of trees in the Amazonian forests, and wonderful the diversity in their combination. Rarely is the soil found occupied for any extent by the same kind of tree. A vast proportion are yet unknown to science. The palms surpass in number and variety all their sylvan brethren. They differ wonderfully in form and size: some, sturdy giants towering up towards the sky with wide-spreading branches; others, delicate little pigmies with slender stems and small broom-like crowns; while others assume the form of creepers, and wind in many folds round the supporting trunks of other trees.

"Among them are four essentially different forms:—the tall ones, with a slender and erect stem, terminating with a crown of long feathery leaves, or with broad fan-shaped leaves," remarks Professor Agassiz; "the bushy ones, the leaves of which rise, as it were, in tufts from the ground, the stem remaining hidden under the foliage; the brush-like ones, with a small stem, and a few rather large leaves; and the winding, creeping, slender species. Their flowers and fronds are as varied as their stalks. Some of these fruits may be compared to large woody nuts with a fleshy mass inside, others have a scaly covering, others resemble peaches or apricots, while others, still, are like plums or grapes. Most of them are eatable, and rather pleasant to the taste."

Among the most beautiful is the mauritia, or miriti, with pendent clusters of reddish fruit; its enormous, spreading, fan-like leaves cut into ribbons. Contrasted with it appears the manicaria, or the bussu, with stiff entire leaves, some thirty feet in length, almost upright, and very close in their mode of growth, and serrated all along their edges. The leaves all sprout from, a comparatively short stem.

More curious is the raphia, with plume-like leaves, sometimes from forty to fifty feet in length, starting also from a short stem—almost from the ground. Its vase-like form is peculiarly graceful and symmetrical.

Among the most curious is the pashiüba barrigudo, or bulging-stemmed palm (*Iriartea ventricosa*); which, rising on a pyramid of roots for several feet, runs up in a single column for some distance, and then swells in a curious spindle-form, again to assume the same proportions as below, till its head spreads out in several fan-like branches with web-shaped leaflets. The tree looks as if supported on stilts, and a person can stand upright among the roots of old trees with the perpendicular stem above his head. These roots have the form of straight rods, and are

studded with stout thorns, whilst the trunk is quite smooth. The purpose of this curious arrangement is probably to recompense the tree by root-growth above the soil for its inability, in consequence of the competition of neighbouring roots, to extend itself underground.

Here, too, grows the slender and graceful assai-palm, with its perfectly smooth trunk,—the fruit appearing in a heavy cluster of berries just below the cluster of leaves on its summit. The stem is hard and tough as horn, and is much made use of, when split into narrow planks, for the construction of walls and flooring of houses.


The fruit is about the size of a cranberry, and of a dark brown colour. When boiled and crushed it yields a quantity of juice of about the consistency of chocolate, somewhat of the colour of blackberry juice, when it has a sweetish taste—and is eaten, made into cakes with the flour of the mandioca root. From it also is formed the favourite beverage of the people. To obtain the fruit, the native fastens a strip of palm-leaves round his instep, thus binding his feet together, to enable him to climb the slippery trunk, which he does with wonderful rapidity, to obtain the fruit at its summit.

Wherever a native village exists, there are seen growing in clusters, beautiful ornaments beside the palm-thatched huts, the tall and elegant pupunha, or peach palm—*Guilielma speciosa*—to the height of sixty feet, and often perfectly straight. A single bunch of the fruit weighs as much as a man can carry, and on each tree several are borne. It takes its name from the colour of the fruit, not from its flavour or nature, for it is dry and mealy, and may be compared in taste to a mixture of chestnuts and cheese. It is eagerly devoured by vultures, who come in quarrelsome flocks to the trees when it is ripe. Dogs often feed on it. It is one of the few trees which the natives brought with them, it is said, from their original home, and have here cultivated from time immemorial. The fruit, when boiled, is nearly as mealy as a potato; and in perfection is the size of a large peach. It is generally supposed that there is more nutriment in the fruit than in fish,—about a dozen forming a meal for a grown-up person. The leaves of its crown are evenly arched over, forming a deep green vault—the more beautiful from the rich colour of the foliage. When the heavy cluster of ripe red fruit hangs under its dark vault, the tree is in its greatest beauty.

The palms are among the most characteristic features of tropical scenery. The variety of their forms, fruit, foliage, and

flowers is perfectly bewildering, and yet as a group their character is unmistakable. On the whole, no family of trees is more similar; generically and specifically, none is more varied. Their leaves follow the simple arrangement of those of grasses, in which the leaves are placed alternately on opposite sides of the stem, thus dividing the space round it in halves. As the stem of the branches elongates, these pairs of leaves are found scattered along its length, and it is only in the ears, or spikes of some genera, that we find them growing so compactly on the axis as to form a close head.

Of this law of growth the palm known as the baccaba is an admirable illustration, its leaves being disposed in pairs one above another at the summit of the stem, but in such immediate contact as to form a thick crown. Its appearance is in

consequence totally different from any other palm, except  perhaps the jacitara, which has a slender, winding stem. Sometimes the crown is more open, as in the inaja—Maximiliana regia—in which the stem is not very high, and the leaves grow in cycles of five, separating slightly, so as to form an open vase rising from a slender stem.

Professor Agassiz remarks that the rest of this tropical forest is as interesting to the geologist as to the botanist, as it reveals to him its relation to the vegetable world of past ages, showing those laws of growth which unite the past and the present.

The tree-ferns—the chamaerops, the pandanus, the araucarias—are modern representatives of past types. The former is a palm belonging to the ancient vegetable world, but having its representative in our days. The modern chamaerops, with its fan-like leaves spreading on one level, stands, with respect to its structure, lower than the palms with pinnate leaves, which belong almost exclusively to our geological age, and have numerous leaflets ranging along either side of a central axis. The young palms, while their elders tower fifty feet above them, are often not more than two inches high; and to whatever genus they may belong, invariably resemble the chamaerops,—having their leaves extending fan-like on one plane, instead of being scattered along a central axis, as in the adult tree. The infant palm is, in fact, the mature chamaerops in miniature; showing that among plants, as among animals—at least in some instances—there is a correspondence between the youngest stages of growth in the higher species of a given type, and the earliest introduction of that type on earth.

More gregarious in their habits than most other palms are the urucuri palms—*Attalea excelsa*—groves of which beautify the higher lands, and grow in vast numbers under the crowns of the more lofty ordinary forest-trees; their smooth columnar stems being generally fifty feet in height, while their broad, finely pinnated leaves, interlocking above, form arches and woven canopies of elegant and diversified shapes. The fruit, in size and shape like the date, has a pleasant flavoured juicy pulp, and falls to the ground when ripe.

Part 3—Chapter XVII.

The Wonders of the Waters.

The Manatee, or Cow-Fish.

To maintain the claim of its ocean character, the Amazon possesses that huge, whale-like creature the manatee, or cow-fish, called by the Brazilians *peixe boi*, or *vacca marina*. It is generally about seven or eight feet long, though it attains a length of ten feet or more, and nine feet and upwards in girth. On the upper part the body is perfectly smooth, and of a lead colour. It tapers off towards the tail, which is flat, horizontal, and semicircular, without any appearance of hind-limbs. The head is in reality small, and the neck undistinguishable; though it has an enormous mouth, with fleshy lips like those of a huge cow, with an ugly countenance. On the lips are stiff bristles, while a few hairs only are scattered over the body. Just behind the head are two powerful oval fins, beneath which, in the female, are the breasts. The ears are very minute holes, and the eyes are extremely small. The skin of the back is fully an inch thick; and beneath it is a layer of fat, also an inch or more in thickness. The fins of the fore-limbs consist of bones exactly corresponding to those of the human arm, with five fingers at the extremity—every joint distinct, although completely encased in its thick inflexible skin.

The manatee ranges from the mouth of the Amazon to the upper waters. It feeds on the grass growing on the borders of the lakes and rivers. It swims at a rapid rate, moved by the tail and paddles. The creature is hunted and killed by the natives with harpoons, the flesh being much sought after. The taste is somewhat between that of pork and beef. The natives dress it by cutting the meat into small pieces and sticking them on

skewers, which they place in a slanting position over the flames to roast.

The female produces one, though sometimes two at a birth, which she holds in her paddles while giving suck. From twenty to twenty-five gallons of oil are obtained from each sea-cow. The poor manatee, little able to defend itself, has other enemies besides man. The jaguar lies in wait for it on the trunk of a tree overhanging the placid pool, and seizing it with his powerful claws as it swims by, holds it in a vice-like grasp, from which in spite of its strength it in vain endeavours to escape.

Those who have voyaged on the ocean, know the solemn feeling and the idea of vastness which is conveyed during a calm at night, when monsters of the deep are heard far and near as they come to the surface to inhale the air, or "blow," as it is called. The same feeling is experienced by the traveller up the Amazon when on board his montaria at anchor, when he hears the splashing and snorting sounds of its numerous inhabitants, as they rise through the mirror-like plain, in which countless thousands of bright stars are reflected. Here fresh-water dolphins roam in great numbers. In the Lower Amazon are two species; one of which,—the tucuxi,—when it comes to the surface to breathe, rises horizontally, showing first the back of its fin, and then, drawing an inspiration, generally diving down head-foremost; and another, called the bonto by the natives. When it rises, it first shows the top of the head, and then floating onwards, immediately afterwards dips its head downwards, its back curving over—exposing successively the whole dorsal ridge without showing the tail-fin; the well-known mode in which the sea-porpoise swims, which makes it appear to pitch head over heels. The natives regard the bonto or largest species with especial awe, and will never kill one voluntarily. Though their fat yields an excellent oil for lamps, they believe that blindness would result from its use.

The bonto is supposed to possess the characteristic of the malign water-nymphs of the Old World. They have a legend that a bonto was in the custom of assuming the shape of a beautiful woman, with hair hanging loose down to her heels; who, going on shore, endeavoured to entice young men to the river. When any unhappy youth, smitten with her charms, was induced to follow her to the water's edge, she would grasp her victim round the waist, and plunging beneath the waves with a triumphant shriek, disappeared with him for ever.

Piranha.

There are several kinds of piranha, many of which abound in the waters of the Tapajos. The piranha, called also the caribe, is a kind of salmon (*Tetragonopterus*). They are caught with any kind of bait, their taste being indiscriminate, and their appetite most ravenous. They frequently attack the legs of bathers near the shore, inflicting severe wounds with their strong triangular teeth.

The Diodon.

The smaller inhabitants of the ocean are also represented in these fresh-waters. The little mamayacú, a species of diodon, which in the ocean attains a foot in length, is found in the Amazon three or four inches long, of a pretty green colour, banded with black. On being caught—which it easily is—it becomes in the hand as round as a ball. The natives, when a person gets corpulent, tell him that he has grown as fat as a mamayacú.

The ocean species, from having the skin about the abdomen looser than that above, floats, when it becomes distended with air, with its back downwards. It can thus move about as rapidly as in its usual position, by aid of its pectoral fins. By the movement of its jaws it makes a curious noise, and can give with its sharp teeth a severe bite. The skin is also covered with small spikes, which, when thus inflated, become erect and pointed.

It thus, though at first sight looking as helpless as can be, is well able to defend itself.

The diodon has been known to be swallowed alive by a shark, in whose stomach it was found floating, probably supported by the air with which it had become inflated. It is asserted that it also frequently eats its way, not only through the coats of the shark's stomach, but through the sides of the monster, which is thus killed. Probably the little diodon of the Amazon has a similar means of revenging itself on the voracious monsters to whom it falls a prey; and though it might not be able to liberate itself through the scaly back of an alligator, it would inevitably kill the monster, or cause him such pain as to make him repent having swallowed so indigestible a morsel.

The magnificent pirarucú or anatto, of vast size, with its ornamental coat of mail, and broad large scales margined with bright red, peoples the waters in immense numbers. It is most frequently caught by the native fishermen; and when salted,

forms the staple food of all classes on the banks of the Lower Amazon. It swims at great speed, and attains the length of eight feet when full-grown, and five feet in girth. The Indian name of pirarucú is given to it from the native words *pira*, fish, and *urucú*, red; in allusion, says Mr Bates, to the red colour of the borders of its scales.

Among the other fish most frequently caught are the surubim and piraepiéua (species of *Pimelodus*); very handsome fishes, four feet in length, with flat spoon-shaped heads, and prettily spotted and striped skins—two long feelers hanging from each side of their jaws like trailing moustaches.

The Acara.

The larger animals which inhabit the mighty river and the network of streams and pools which surround it on both sides, have been described; but numerous smaller creatures dwell within it, equally curious, and many totally unlike those to be found in other parts of the world. It has generally been supposed that, of all creatures, fish are the most destitute of parental feelings, and that from the moment the eggs have been deposited in the sand or mud, they are allowed to struggle into existence as best they can, to do battle with their foes, and the numerous dangers to which they are exposed. In the acara, however, we have an example of parental care and watchfulness unrivalled by any terrestrial animal.

The male of this curious fish has a conspicuous protuberance on the forehead, wholly wanting in the female and the young. Somehow or other, the eggs of the female are conveyed into the mouth of the male, the bottom of which is lined by them, between the inner appendages of the branchial arches, and especially into a pouch formed by the upper pharyngeals, which they completely fill. They are there hatched; and the little ones, freed from the egg, are developed until they are in a condition to provide for their own existence. In their head there is a special lobe of the brain, similar to those of the triglas, which sends large nerves to that part of the gills protecting the young, thus connecting the care of the offspring with the organ of intelligence. In this curious cavity of the father's head the young fish are found in all stages of development,—the more advanced, a quarter of an inch long, and able to swim about, full of life and activity. These appear to exist outside the gills, within the cavity formed by the gill-coverts and the wide branchiostigal membrane. The eggs remain in the back part of the gills.

The parent's care does not appear to cease even when the young are fully developed, but he allows them to swim in and out, and try their powers, if not to search for food; and when danger appears, opens his mouth, when they all swim back again in a shoal, for safety. The natives assert that some species, at all events, are not actually developed in the parent's head, but are laid and hatched in the sand, the male and female watching carefully over them; and that the father only takes charge of them when they are hatched, and receives them within his mouth to protect them from danger. From the observations of Professor Agassiz, however, there is no doubt that in some species, at least, the whole process of development is begun and completed in the gill cavity.

The species which lay their eggs in the sand belong to the genera *Hydrogonus* and *Choetobranchus*. They build a kind of flat nest in the sand or mud, in which they deposit their eggs, hovering over them until the young are hatched.

Curious also is the little bill-fish—the *lymnobellus*—with its long beak.

Another fish (the *anojas*), common in the Amazon, takes shelter—for it cannot be said to build a nest—in a hollow log. It belongs to the genus *Auchenipterus*. Numbers of this fish are found crowded in dead logs at the bottom of the river. One examined by the Professor, was filled with fish of all sizes, from those several inches long to the tiniest young. The fish were so dexterously packed into the log from one end to the other, that it was impossible to get them out without splitting it open, when they were all found alive and in a perfectly good condition. They could not have been jammed artificially into the hollow wood in that way without injuring them.

Anableps.

We have heard of blind fish, but here is one—called by the Indians *tralhote*, and known to naturalists as the *Anableps tetraophthalmus*, signifying “four-eyed”—possessing four eyes. A membraneous fold, enclosing the bulb of the eye, stretches across the pupil, dividing the visual apparatus into the upper and lower half; a curious formation, suited to the peculiar habits of the *anableps*. These fishes gather in shoals on the surface of the water, their heads resting partly above and partly below the surface, and they move by a leaping motion somewhat like that of frogs on land. Thus, half in and half out of the water, they

require eyes adapted for seeing in both elements, and the arrangement described just meets this want.

The Parrot-Fish.

The birds of the air have, in this region, their representatives in the water. Among them is the curious and handsome pirarara, or parrot-fish. It is a heavy, broad-headed creature, with a bony shield over the whole head. Its general colour is jet-black, its bright yellow sides deepening into orange here and there. The yellow fat of this fish has a curious property. The Indians assert that when parrots are fed upon it they become tinged with yellow, and they often use it to render their papagaios more variegated.

The Gymnotus.

On the Amazonian waters is found the carapus, called by the Brazilians sarapo, belonging to the genus *Gymnotus*; though far smaller than the electric gymnotus. They are very numerous, and the most lively of the whole group. Their motions are winding and rapid, like those of the eel; but yet different, inasmuch as they do not glide quickly forward, but turn frequent somersaults, and constantly change their direction.

Localisation of Fish.

The researches of Professor Agassiz prove that the localisation of species of fish in these waters is peculiarly distinct and permanent, their migrations being very limited—consisting chiefly in removing from shallow to deeper waters, and from these to shallow again, at those seasons when the range of the shore in the same water-basin is affected by the rise and fall of the river. Thus, the fishes found at the bottom of a lake covering, perhaps, a square mile in extent when the waters are lowest, will appear near the shores of the same lake when, at the season of high-water, it extends over a much wider area. In the same way, fishes which gather near the mouth of a rivulet at the time of low-water, will be found as high as its origin at the period of high-water; and those which inhabit the larger igarapes on the sides of the Amazon, when they are swollen by the rise of the river, may be found in the Amazon itself when the stream is low. There is not a single fish known to ascend from the sea to the higher courses of the Amazon at certain seasons, and to return regularly to the ocean.

The striking limitation of species within different areas does not, however, exclude the presence of certain kinds of fish simultaneously throughout the whole Amazonian basin. The piraracu, for instance, is found everywhere from Peru to Para; and so are a few other species more or less extensively distributed over what may be considered distinct ichthyological fauna. But these wide-spread species are not migratory. They have normally and permanently a wide range—just as some terrestrial animals have an almost cosmopolitan character—while others are circumscribed within comparatively narrow limits.

Surprising indeed is the variety of species of fishes contained in the Amazonian basin. Professor Agassiz, during his expedition, collected nearly two thousand, "for the most part," as he observes—and which is still more surprising—"circumscribed within different limits, from Tabalinga to Para, where the waters differ neither in temperature, nor in the nature of their bed, nor in the vegetation along their borders. There are met with, from distance to distance, assemblages of fishes completely distinct from each other."

Still more curious, perhaps, is the intensity with which life is manifested in these waters. All the rivers in Europe, from the Tagus to the Volga, do not nourish a hundred and fifty species of fresh-water fishes; and yet in a little lake near Manaos, called Lago Hyanuary, the surface of which hardly covers four or five hundred square yards, more than two hundred distinct species were discovered, the greater part of which have not been observed elsewhere.

Gymnotus, or Electric Eel.

In the forest pools, as well as in the marshy ponds and slow-flowing rivers of the Llanos, numbers of huge serpentlike heads may be seen bobbing above the surface; or a huge, thick-bodied, yellow, snake-like creature may be caught sight of gliding through the water. It is the *gymnotus electricus*, or electric eel,—one of the many curious inhabitants of this region,—from two to five, and even eight feet in length. Though really a fish, it resembles the eel, but is stouter in its proportions. It is nearly equal in thickness throughout. It has a rude, depressed, and obtuse head, and a compressed tail. So great is the electric power it possesses, that when in full vigour it is able to kill the largest animal, when it can unload its electric organs in a favourable direction. All other fish, knowing by instinct the deadly effects of its stroke, fly from the formidable

gymnotus. When fish are struck, or any animals which enter the pools inhabited by gymnoti—to drink, or cool their bodies, heated by the burning sun of the Llanos—they become stupified, and thus easily fall a prey to the electrical tyrant.

The natives of Venezuela employ a cruel mode of catching the creatures, which, notwithstanding their nature, they use as food. Placing but little value on mules and horses, they collect a number of these animals, and, armed with harpoons and long slender rods, drive them with shouts towards a pool inhabited by gymnoti. The noise of the horses' hoofs and the men's shrieks make the fish issue from the mud, when the huge, hideous creatures swim on the surface of the water, and crowd under the bellies of the horses and mules. Some of the Indians climb the trees; others stand round the margin, urging forward the unfortunate animals, and preventing them from making their escape. The fish defend themselves by frequent discharges of their electric batteries. At first they seem likely to prove victorious. Some of the quadrupeds sink beneath the violence of the invisible strokes which they receive from all sides, and, stunned by the force and frequency of the shocks, disappear under water; others, with their manes erect and eye-balls wild with pain, strive to escape the electric storm which they have aroused, but are driven back by the shouts and long whips of the excited Indians. The livid, yellow eels, like great water-snakes, swim near the surface and pursue their enemy. After the conflict has lasted a quarter of an hour or so, the mules and horses appear less alarmed. They no longer erect their manes, and their eyes express less pain and terror. The eel-like creatures, instead of advancing as at first, swim to the shore, when the Indians attack them with their harpoons, and by means of a long cord attached to it, jerk the fish out of the water, without receiving any shock, as long as the cord remains dry.

Such is the description given by Humboldt, a witness of the extraordinary scene. The employment of their electric powers is evidently spontaneous, and exhausts the nervous energy. Like voluntary muscular effort, it needs repose, and the creatures require an abundance of nourishment and rest before a fresh accumulation of electricity is produced.

In the dry season they form deep circular holes for themselves in the mud of water-courses, and marshes which remain filled with moisture, and they are thus able to support existence in their usual localities, while alligators and turtles have to retire

to the larger pools or rivers. In the shallow ponds of the forest they are easily driven out with long poles.

Bates amused his native companions, who had thus caught some of the creatures, by showing them how the electric shock could pass from one person to another. They joined hands in a line, while he touched the biggest and freshest of the animals on the head with the point of his hunting-knife. He found, however, that the experiment did not succeed more than three times with the same eel when out of the water, for the fourth time the shock was scarcely perceptible.

The limbs even of the strongest man are benumbed, and he is struck down helpless, by a discharge from the battery of the gymnotus. The organs which produce this curious electrical effect are placed along the under side of the tail. They may be compared to a series of columns inclosed in a thin membrane packed closely together, which, consisting of a series of fiat discs, may be imitated by placing a number of coins with their discs parallel to each other, and with a bladder between each, separated by a gelatinous substance. These columns are technically called septa; and La Cépède calculates that two hundred and forty transverse membranes are packed in each inch, thereby giving to an electric eel eight feet in length an organ cavity of two hundred and forty-six square feet—an enormous extent, as may be supposed, of electricity producing surface. The whole apparatus is supplied with nerves which run through the entire length of the body.

Sting-Rays.

A fresh-water species of sting-ray is an inhabitant of the creeks and lagoons of stagnant water; and so infested are some of them with the creatures, that it is almost certain destruction to venture into them. The sting-ray is circular and flat, with a tail above a foot in length, very thick at the base, and tapering towards the end. Near the middle, on the upper part, it is armed with a long and sharp-pointed sting, finely serrated on two sides, which the fish can raise or depress at will. When disturbed, by a quick movement of the tail it darts its sting towards the object, which it seldom fails to reach. The wound thus inflicted is so severe that the whole nervous system is convulsed, the person becoming rigid and benumbed in a few moments. Long after the most violent effects of the wound have subsided, the part affected retains a sluggish ulceration, which has often baffled the skill of the best surgeons.

They frequent the shallow banks of muddy pools, where they may be constantly seen watching for their prey, and, as if conscious of their powers, scarcely deign to move off when approached. They have their enemies in vultures and other birds of prey; and as they are considered fit for food, war with spear and talon is constantly waged upon them.

Serrosalmus Piraya.

In the Orinoco another dangerous creature exists, called by the natives piraya, with a head shaped somewhat like a sabre. The lower jaw is furnished with a formidable pair of fangs, not unlike those of the rattlesnake. With these it inflicts a gash as smooth as if cut with a razor.

The Caribe.

Every feature of the savage caribe denotes the ferocity and sanguinary nature of its tastes. The piercing eye, surrounded by a bloody-looking ring, is expressive of its cruel and bloodthirsty disposition. Its under jaw, lined with a thick cartilaginous membrane, adds greatly to its strength, protruding considerably beyond the upper, and increasing the ferocious expression of its countenance. Large spots of a brilliant orange hue cover a great portion of its body. Towards the back it is of a bluish ash colour, with a slight tint of olive-green; the intermediate spaces being of pearly white, while the gill-coverts are tinged with red.

So sharp are its triangular teeth, arranged like those of the shark, that neither twine, copper, nor steel can withstand them. At the sight of any red substance, blood especially, they swim forward to the attack; and as they usually move in swarms, it is extremely dangerous for man or beast to enter the water with even a scratch upon their bodies. Horses wounded by the spur are particularly exposed to their attacks when fording a stream; and so rapid is the work of destruction, that unless immediate assistance is rendered, the fish soon penetrate the abdomen of the animal and destroy it: hence the name given to them by the Spaniards means "tripe-eater." When a net is drawn on shore, numbers of these little pests are seen jumping in the crowd, their jaws wide open, tearing whatever comes in their way, and especially the meshes of the nets, which they soon render useless.

Some tribes of natives place their dead in the water, when these creatures speedily eat the flesh off the bones, which are then preserved in baskets.

Even human beings, when bathing, or fording rivers, are attacked by these terrible little cannibals;—for cannibals they are, as, whenever any of their own race are killed, they instantly attack and devour them.

There are other species of this fish,—among them the black caribe of the Orinoco. There is also a small species—a harmless, pretty little fish, of a bright green colour on the back, and a white belly streaked with pink. The teeth are used by the Macoushi Indians for sharpening the points of their poisoned arrows. This they do by drawing them rapidly between two of the teeth, in the way that knives are sharpened by two circular steel files, now in common use.

Adaptation of Animals to their destined Mode of Existence.

Strange and unfitted for existence as are many of the animals formed by the Almighty to the short-seeing eye of mortals, on a further acquaintance with them all will be discovered admirably suited to the life they are destined to enjoy. Following Waterton, we may take five as an example. The sloth, which has four feet, is unable to use them to support his body on the earth. They are destitute of soles, and the muscles requisite for progress in a perpendicular position; yet no creature is more thoroughly at home when clinging to the trees on which it has been created to exist. The ant-bear, without a tooth in his head, roves fearlessly in the forests inhabited by the jaguar and boa-constrictor. The sharp claws of his fore-feet enable him to confront the former, and his powerful muscular body and thick hair set even the boa at defiance. The vampire is unable to use his feet for walking, but he possesses a membrane, stretched by means of his legs, which enables him to mount up into an element where no other quadruped can follow. The armadillo, without fur or wool or bristles, has in their stead a movable shell placed on his back, so formed that he can roll himself up in a ball, while with his sharp claws he can dig rapidly into the earth to escape his foes. The tortoise is compelled to accommodate itself to the shell, which is hard and inflexible, and in no way obedient to the will of its bearer; yet that very shell, although so apparently inconvenient, serves as its protection. The turtle is protected in the same way; but its delicious flesh brings numerous enemies to attack it, from whom it has a hard task to escape. The egg of the tortoise, it may be remarked, has a very hard shell; while that of the turtle is quite soft.

Part 3—Chapter XVIII.

Natives of the Valley of the Amazon.

A vast number of tribes inhabit the banks of the Amazon and its tributaries, who, though having a general resemblance, differ in their habits and customs. Those found on the Lower Amazon are more or less civilised, and are known as Tupis, or Tapúyas. They speak the lingua Geral, and sometimes Portuguese. The lingua Geral is the ancient Tupée language, considerably modified by the Jesuits, who taught it to all those under their control.

The Amazonian Indians have generally fine figures, their chests especially being well developed; their skin is of a copper hue, of various shades, sometimes almost of a dark brown. The hair is jet-black, straight and thick, and never curled. The eyes are black; and they have little or no beard. The face is generally wide, and somewhat flattened, with but little or no projection of the cheek-bones. Indeed, their features are often very regular; and many, except in colour, differ but little from well-formed European countenances.

The Mundurucus.

One of the largest semi-civilised tribes inhabiting the banks of the Tapajos are the Mundurucus. They are noted for tattooing their bodies more completely than any other tribe. The whole body is covered with straight lines in diagonal patterns from the mouth downwards, the upper part being left free. Some of the women, whose bodies are ornamented in the same fashion, have lines round their eyes, which look as if they were intended to represent a pair of spectacles. Even these marks, however, do not destroy the soft drooping look of the eyes common to Indian women. The countenances of some of the men are fine; the face, bold, solid, and square, possessing a passive dignity, with a look of tranquillity which appears immovable.

The more elaborate style of tattooing is only practised by the chiefs, as a mark of their birth and rank. It requires ten years to complete the whole process. The colour is introduced by fine puncturings over the surface—a painful process, which causes swelling and inflammation.

They are among the most warlike Indians of the Amazon, and keep the neighbouring and less civilised tribes on their good behaviour. They are expert agriculturists, and construct canoes

and hammocks. They generally make a foray every year on an adjoining tribe,—the Parentintins,—when they kill the men, whose heads they preserve by drying and smoking, while they take the women and children for slaves. They have regular villages of conical huts, the walls and framework filled in with mud and thatched with palm-leaves. In the centre is a large hut in which the fighting men sleep, with their weapons ready for use. It is ornamented within with the dried heads of their enemies. They have of late years greatly decreased in numbers.

Some thirty tribes or families are found on the River Uapes. The men wear their hair in a long tail hanging down the middle of the back, while the women wear it loose, and cut to a moderate length. The only dress worn by the men is a small piece of matting passed between the legs, and secured round the loins by a string. The women wear none whatever, but paint their bodies in regular patterns,—generally red, yellow, and black colours. The only ornament worn by the women is a bracelet on the wrist; while below the knee a garter is fastened from infancy, for the purpose of swelling out the calf.

The men, however, adorn themselves in a variety of ways. Their hair is carefully parted and combed on each side. The young men, especially, wear it in long locks on either side of their necks, with a comb stuck on the top of the head—their feminine appearance being greatly increased by the large necklaces and bracelets of beads which they wear, and by their custom of pulling out every particle of hair from their beard. As these feminine-looking warriors always carry their large shields before them, it was but natural, when the Spaniards saw them, or other tribes similarly adorned, that they should have supposed them to be women. When, also, they saw in the distance parties of unadorned persons carrying burdens, they took them to be slaves captured in war. This, no doubt, was the origin of the fable of nations of Amazons found on the banks of the river.

General Character of the Natives.

Sometimes these natives wear circlets of parrot and other gay feathers on their heads, as well as armlets and leg ornaments of the same materials. Some of these tribes have the horrible custom of baking the bodies of their dead after they have become decomposed, till only a black carbonaceous mass is left. This is pounded, and mixed with an intoxicating liquor, called caxiri, in vats made out of hollow trees. The relatives having been invited, the whole company drink the mixture, under the belief that the virtues of the deceased will thus be transmitted

to them. Some of them are cannibals, and make war for the express purpose of procuring human flesh. They smoke dry what they cannot at once consume, thus preserving it a long time for food. They have no definite idea of a God; but they dread an evil spirit, whom they believe delights in afflicting them, and is the cause of death.

Their houses hold a number of families; sometimes a whole tribe. They are upwards of 120 feet long, 80 feet broad, and 30 feet high. The plan is a parallelogram, with a semicircle at the further end. A passage twenty feet wide leads from one end to the other; while, on the sides, are partitions, like the stalls in an old-fashioned public room of an inn, each of which is inhabited by a separate family. The chief, or tushaúa, resides at the semicircular end, where he has a private entrance. The furniture consists of hammocks, with various pots and cooking utensils made of clay, as well as baskets. Their canoes are formed out of a single tree, hollowed and forced open by cross-pieces. Some are forty feet in length. The dead are nearly always buried in the houses: a large house having sometimes one hundred graves in it.

From the Rio Negro to the Andes there is a large region, inhabited entirely by savages of whom little is known, except that they are mostly cannibals, and kill all their first-born children. On the other side of the Amazon also is a still larger tract of virgin forest, where not a single civilised man is to be found.

The Purupurus.

Among these tribes, the Purupurus, although thorough savages, are perhaps the best-known. They wear no clothes whatever; their habitations are small huts rudely formed of boughs, which they set up on the sand. Their canoes are of the rudest construction, having flat bottoms and upright sides. They use neither the bow nor the gravatana, but instead have a weapon called the palheta, from which they can cast an arrow, as from a sling, with wonderful dexterity. In the septum of the nose and in the ears they bore holes, in which they wear rings.

The Catauixis.

In their immediate neighbourhood, the Catauixis tribe is found. Though they go naked, they build houses, and use bows and gravatanas. Their canoes are constructed of the bark of a tree

taken off entire. They are also cannibals, and murder the people of other tribes whom they can surprise.

Many of the least barbarous tribes have frequently large meetings, when they dress up in feather ornaments of parrots and macaws in a variety of curious disguises. The chief wears a head-dress of toucan feathers, with the erect tail-plumes rising from the crown. The mask dresses are long cloaks, made of the inner bark of a tree. Sometimes they manufacture head-pieces, by stretching the cloth over a basketwork frame, to represent the heads of monkeys and other animals. When thus dressed, they perform a monotonous seesaw and stamping dance, accompanied by singing and drumming. Often this sport is kept up for several days and nights in succession. During the time, they drink large quantities of caxiri, while they smoke tobacco and take snuff. Their chief masker represents their demon Jurupari, but he does not appear to be treated with any particular respect.

Very little information has been gathered of the history of these tribes, as they seldom possess any knowledge of their ancestors beyond the times of their fathers or grandfathers. Few of them have benefited in any way by their intercourse with white men, but remain in the same barbarous condition in which they have probably existed for many centuries. A further description of their savage customs would be more disagreeable than satisfactory. We can only hope that the true gospel may be some day carried among them, and that they may be redeemed from their present barbarous condition.

Part 3—Chapter XIX.

Indian Weapons and Modes of Killing Game.

The Blow-Pipe.

The Indian, destitute of firearms, ranges through the forest in chase of the fiercest and largest animals which haunt its shade, armed with a slender tube, and a quiver full of needle-like arrows. The tube, ten or eleven feet long, is the celebrated gravatana, or blow-pipe; called also the zarabatana by the Spaniards. Slight as are the arrows which are blown through this weapon, they will penetrate the thickest hide; and being tipped with a deadly poison, carry death through the veins of the wounded animal in the course of a few minutes.

Blowpipes are formed in various ways,—for one, the stems of a small palm, the *triatea setigera*, are used. Outside they appear pointed, from the scars of the fallen leaves, but within they have a soft pith, which soon rots in water, and is easily extracted, leaving a smooth, polished bore. They vary from the thickness of a finger to two inches in diameter. Each of these stems is slender, the one of a size which may be pushed inside the larger. This is done that any curve in the one may counteract that in the other. A conical wooden mouthpiece is fitted on the one end, and the whole is spirally bound with the smooth black bark of a creeper. Two teeth, fastened about a couple of feet apart from the mouth end, serve as sights to enable the sportsman to take better aim. The end applied to the mouth is bound round with a small silk-grass cord to prevent it splitting; while the other is strengthened by having the seed of a nut, with a hole cut through it, secured round it.

The arrows, from nine to ten inches long, are made from the leaves of a species of palm, or from the spinous processes of the *patawá*, pointed as sharp as a needle. The other end is burned hard, and round it is wound a little conical tuft of tree-cotton, the silky covering of the *bomba*, so as exactly to fill up the bore of the tube. They are carried in a quiver, which holds some hundreds. It is in shape somewhat like a backgammon dice-box, formed of basketwork, and covered with a piece of the skin of the *tapir*. To it is attached a bunch of silk-grass, a small piece of bone for scratching the point of the arrows, and a basket for holding wild honey secured round the blunt end. The points of the arrows are tipped with the deadly *wourali* or *urali* poison.

Another kind of *gravatana* is made of two separate pieces of wood, each scooped out so as to form one half of the tube. The two halves are then secured together, by binding round them spirally long fiat strips of the *jacitira*, or wood of the climbing palm-tree, the whole being afterwards smeared over with the black wax of the *melipona* bee. The tube tapers towards the muzzle, and a cup-shaped mouthpiece is fitted in the broad end. It is so heavy that only a strong man, accustomed to its use, can employ it.

The boys learn to shoot with a smaller and lighter instrument. The tools used are made of the incisor teeth of the *paca* and *cavy*. A light arrow is put in at the inner end, and when the ball of silk-cotton secured to the shafts fits tightly, it can be propelled with such force by the breath that it makes a noise almost as loud as a pop-gun when flying from the muzzle. An

expert Indian can propel arrows so as to kill at a distance of fifty or sixty yards. It is more useful in the forest than a gun, for the report of firearms alarms the birds or monkeys, while the silent poisoned dart brings them down one by one, until the sportsman has a heap of slain by his side.

Wourali Poison.

The wourali poison is made chiefly by the natives of the northern part of the Amazonian valley. It is looked upon as an important and somewhat mysterious operation. Waterton and Schombergh describe it. The Indian, when preparing to concoct this deadly compound, goes into the wilds where grows a vine—the *strychnos toxifera*. After this he collects a number of bundles, and then takes up a root with an especially bitter taste. After this he searches for two bulbous plants, which contain a green and glutinous juice; and lastly, collects two species of ants—one very large and black, and so venomous that its sting produces fever, and another little red ant which stings like a nettle. Having scraped the wourali vine and bitter root into thin shavings, he puts them into a sieve made of leaves, which he holds over the earthen pot, pouring water on them. A thick liquor comes through, having the appearance of coffee. He then produces the bulbous stalks, and squeezes a portion of the juice into the pot. He now adds the pounded fangs of the labarri and counacouchi snakes,—which he generally has in store, as well as the ants. The ingredients are next boiled over a slow fire, and the scum being taken off, the liquid remains till it becomes reduced to a thick syrup of a deep brown colour. It is now fit for use. The arrows are then dipped into it, and if it is found of sufficient strength, it is poured into small pots, which are covered over with leaves and a piece of deer-skin. It is then kept in a dry place, or suspended occasionally over a fire, to counteract the effects of damp.

The poison must be fresh to kill speedily. A bird dies in a minute or so, and the largest animals only survive a few minutes after being struck. Salt is almost a certain antidote to the poison. The Indians, when they wish to preserve an animal alive, scrape off part of the poison, and, as soon as the animal falls, put salt into its mouth, when it speedily recovers. Monkeys are frequently captured in this way. Europeans accustomed to eat salt seldom suffer from the effects of the poison; though it is said to produce its usual deadly effects on the natives, when wounded by it, as they rarely or never consume salt.

The flesh of the animals killed is in no way injured by the poison, nor does it appear to corrupt sooner than that killed by the gun or knife.

Bows, with arrows four or five feet long, are used to kill the larger animals. The arrows are made of a yellow reed without joint or knot. A piece of hard wood is inserted into the end, and in this a square hole is made, tightly bound round with cotton to keep it from splitting. Into this square hole a spike is fitted, and dipped in the poison, while at the butt-end a couple of feathers are fastened to steady it in its flight. The hunter carries a number of these poisoned spikes. As the spike easily breaks off, or slips out when the animal is wounded, he recovers his shaft, into which he can easily refit another spike. The spikes are cut half through, to facilitate their breaking off.

Timbó.

The Indian has also discovered the means of poisoning the fish of the lakes and pools, as well as the birds of the air. He extracts the poison from a certain liana—the *paullinia pinnata*—which he calls timbó. To do so, he collects a few pieces, about a yard long, and mashes and soaks them in water, which soon becomes discoloured with the milky poisonous juice of the plant. This he carries in a calabash, and pours out on the water. In about half an hour, all the smaller fish, over a wider space than that which he has sprinkled with the juice, rise to the surface, floating on their sides, with their gills wide open. So powerful is its nature, that but a slight quantity appears sufficient to stupify them. Some time afterwards the larger fish appear; and even for twenty-four hours afterwards a number rise floating dead on the surface. The fish are evidently suffocated by the poison.

Mode of Shooting and Netting Turtle.

Both fish and turtle are shot by the natives with arrows. The Indian takes his post on a little stage made of poles and cross-pieces of wood, secured with lianas, on the margin of the pools frequented by the turtles, armed with his bow and arrows. The arrow used for killing the latter has a strong lancet-shaped steel point fitted into a peg which enters the tip of the shaft. The peg is secured to the shaft by twine made of the fibres of pineapple leaves. The line, some thirty or forty yards long, is neatly wound round the body of the arrow. When the muzzle enters the shell the peg drops out, and the pierced animal descends with it towards the bottom, leaving the shaft floating on the

surface. The sportsman, hastening to the spot in his canoe, sends another arrow into the turtle, and then humouring it by means of the two cords, quickly gets it on board. It is extraordinary, the skill the Indians will display on these occasions. They do not even wait for the turtle coming to the surface, but watch for the tracks which it makes in the water when swimming beneath it, and shoot with unerring aim.—At certain seasons turtle in vast shoals wend their way up the Orinoco, when, as they come to the surface to breathe, the Indians—who are on the watch—shoot them with heavy arrows, which, falling perpendicularly, pierce their thick coats; and they drift on shore, or are picked up by the canoes kept in readiness for that purpose. Nets also are employed: the depth is about equal to that of the water; while the floats, buoyed up on the surface, thus form a complete track. One party takes either end of the net, while the rest beat the water with poles, in order to drive the turtles towards the middle. As the beaters advance, numbers of little snouts suddenly popping above the water show that all is going on well. The beaters continue shouting and striking the water with great vigour. The ends of the nets are then seized by numerous strong hands and dragged quickly forward, forming a circle to inclose all the body. The canoes being brought up, the turtles are thrown into them. Mr Bates describes having seen fully eighty turtles secured thus in about twenty minutes.

Another Mode of Catching Fish.

The natives on the banks of the northern rivers also employ a poisonous root for catching fish. It resembles a turnip, with a small plant rising from it, and is called by them cima. A decoction of it being made, it is mixed with boiled maize ground into paste. The Indian and his family go forth to the pool with a number of baskets to carry home their prey. Besides the poison-paste, he supplies himself with some pellets of paste free from it. On arriving at the pool or stream, he throws a quantity of the latter into the water, which attracts a variety of small fish from all quarters. He then begins to throw in the poisoned bait, which is no sooner swallowed than the fish begin to leap out of the water, and tumble about in all sorts of ways, when they are easily caught by the children, and thrown into their baskets, which in a short time are filled.

The Indians of the Orinoco also entrap fish in other ways. When the waters begin to ebb at the end of the rainy season, they form strong stockades across the outlet of the great lagoons in which a number of the larger fish, as well as turtles of

enormous size, have taken refuge. The stakes of these stockades are driven into the bed of the channel, close enough to allow of the exit of the water and the smaller fish only. It is further secured by cross-beams thrown across the channel. Sometimes, however, so numerous are the fish, and so enormous their size, that they break through the stockade in spite of all the precautions taken.

Poisoning Birds.

In the neighbourhood of the Apoure, in Venezuela, a poisonous shrub abounds—the deadly guachamaca—belonging to the family of Apocinese, or dog-bane. The natives make a strong decoction from it, into which they dip a number of small fish, and spread them about in the neighbourhood of lagoons frequented by cranes, herons, and other aquatic birds, hiding themselves near at hand. Before the bird has fairly swallowed the fish it drops dead, when the hunter, cutting off the head and neck, carries off the body as his prize. It is said that when meat has been roasted on spits made of this wood, it has absorbed sufficient poison to destroy all who ate it.

The Long-Bow.

Some tribes, using a powerful long-bow, shoot birds in the air at a great distance. The hunter, throwing himself on his back, with his quiver by his side, places his feet against the bow, raised to the required elevation, and thus, stretching out his legs, draws the arrow to his head on the ground. By this means he is enabled to kill wild fowl and other game at an enormous distance. An amusing writer on Venezuela mentions an Indian who used to place a piece of money on the top of a lemon, close to the point of the big toe on his left foot, and then, leaning backwards, bend his bow with the help of his right one, and shoot into the air at an angle of 85 degrees,—the arrow never failing when it turned round to come down and strike the coin. Another would shoot a bird soaring above his head, without looking at the bird,—guided only by the shadow cast upon the ground about mid-day.

Stalking Game.

In the same legion, the Indians form a sort of trumpet out of bamboo, covering one end with a thick membrane. On blowing through the other, a sound is produced resembling the bleating of a young fawn. Hiding himself behind a tree, the hunter

decoys the doe towards his place of concealment, when he easily shoots her with his poisoned arrow.

The following is another device for approaching the deer in the open plains. These animals seem to have a peculiar fondness for the tall crane of the Llanos—a large white bird, with long, slender legs, and at least five feet in height. It has a pouch of a bright scarlet, and a bill nearly a foot long, and wide at the base, which enables it to swallow a large fish at a mouthful. The hunter forms a mask to resemble the head of the crane, and, clothing his own dark body in white, holding his weapon low down, goes off in the direction of the deer, taking care to approach it to leeward. He then imitates the movements of the crane. When the deer stops to look at him, he bends down his head as if feeding. As soon as the deer again begins to browse, the hunter carefully approaches it till he gets within range, and can shoot his deadly dart with certain aim.

Mode of Killing Alligators.

The Indian bravely attacks the huge alligator, fearless of its enormous jaws, sometimes shooting it with arrows from his bow. The arrows are fitted in the same way as those used for killing turtle—the head remaining in the body of the animal, while the shaft, secured to it by a line, floats on the surface; which showing the direction taken by the saurian, it is chased and transfixed by either lances or arrows till it dies from exhaustion. On these occasions it is often attacked, it is said, by the caribes, and partially devoured, before it can be dragged on shore.

The creatures are also caught by another device. A piece of hard wood, pointed at both ends, is covered up with a large fish or lump of meat, and then thrown into the water, with a strong rope attached to the middle. The instant it is seized, the hunters, who have hold of the other end, drag the creature on shore, and despatch it with clubs or darts.

A story is told of a Llanero, who, accustomed to desperate encounters with savage bulls and fierce jaguars, determined on one occasion, when compelled to cross the river, to brave the risk of an attack from an alligator known to infest it. Plunging into the stream, with his saddle on his shoulders to prevent its being wetted, and his sharp dagger in his teeth, he swam on his horse's back. As those who saw him expected, the crocodile soon appeared. Boldly facing the creature, he approached its jaws, and, throwing his saddle at it, the alligator jumped partly

out of the water to catch it. At that instant the daring Llanero plunged his dagger up to the very hilt into the arm-pit—the most vital part of the monster—when, with a tremendous splash, it instantly sank beneath the waves.

The tenacity of life exhibited by these monsters is often marvellous. Sir Robert Schombergh gives an account of shooting one when ascending the River Berbice. The snout was taken off by one ball, and another entered the hinder part of the skull, when the Indians, attacking it with their clubs, appeared completely to have knocked out every spark of life. It was at last hauled up and placed on the bow of the corial. While the corial was being drawn across the rapids, two of the Indians took up the cayman in order to lay it in a more convenient position. Scarcely had they done so, when at one bound it jumped into the river and disappeared. They could never afterwards be persuaded to touch a cayman.

Turtle-Catching and Collecting Eggs.

Both the Amazon and the Orinoco, with their tributaries, are frequented by several species of turtles. The mode employed for capturing the animals, as well as collecting the eggs, applies equally to both rivers.

There are several species of fresh-water turtles. The largest in the upper waters grow to a great size, measuring nearly three feet long, by two in breadth; so that one is a load for the strongest man. The Brazilian Government make regulations for protecting the turtles whilst laying, so that all the inhabitants on the banks may have an equal chance of procuring a supply of eggs. The natives collect from all quarters for this object. The turtles select the highest and driest banks composed of the finest sand, which will be a sufficient time above water to allow of the eggs being hatched by the heat of the sun. Some of these banks are of great extent—many miles long, and often one or more broad. They are the haunts and breeding-places of many different kinds of animals, and are covered by tracks of alligators and turtles. Not only do these here make their nests, but birds lay in them their eggs during the dry season; and different kinds of fish use them for the same purpose when covered with water. Here, too, the wonderful little acara are found, with their young in their heads; and there are also rounded shallow depressions in the mud, which the fishermen say are the sleeping-places of the skates. They are certainly about the size and form of a skate, and it can easily be believed that these singular impressions in the soft surface have been

made in this way. The creatures, however, only frequent certain praias out of the number existing. When the waters overflow the land, the young turtles move into the interior, where they remain during their infant days in the numberless lakes and pools in the forest. As the dry season approaches, the full-grown turtles descend from the interior pools while the outlets are still open (between July and August), and seek in countless swarms their favourite banks. Sentinels are then posted on high lookout places, situated at the ends of the banks, where they may watch the proceedings of the creatures, and mark the spots they have chosen. They also warn off any fishermen who may approach, as the sight of a man or a fire on the sand-bank would prevent the turtles from leaving the water that night to lay their eggs; and, if frequently alarmed, they would forsake the praia for some other place.

The turtles lay their eggs by night—crawling in vast crowds to the central and highest part of the praia—and are occupied till dawn in the operation. They excavate with their broad-webbed paws deep holes in the fine sand. The first which arrives makes a pit about three feet deep, and lays its eggs—about one hundred in number—covering them with sand. The next makes its deposit at the top of the former; and so on till every pit is full. They are so careful in covering up the eggs, that, when they quit the spot, the only marks distinguishable are those which they make when returning to the water—as they go round and round the nest several times in succession to obliterate all traces. The sand, however, remains so loose, that it gives way under foot, and thus the Indian easily discovers the spot.

A body of turtles occupy several days in the operation; one party succeeding the other, night after night, till all have deposited their eggs. As the season advances, however, those who have arrived late, in their hurry to lay, appear to take fewer precautions. So powerful is the effect of the sun on these sand-banks, that a few days only are required to hatch the young turtles.

It has been so arranged by the Creator, that they always come forth at night, as the heat of the sun would kill them, and they would be devoured by birds of prey and other animals on the watch to seize the dainty morsels. Although the hole from which they emerge may be half a mile or more from the river, instinct teaches them to go in a direct line to the water. A number, however, are caught by their enemies; while enormous

quantities of eggs are taken,—both to be used as food, and for the sake of the oil they contain.

A curious sight is witnessed from the top of the sentinel's stage at daybreak. The sand appears blackened with the multitudes of turtles—which, after depositing their eggs, are waddling towards the river; and often, where the margin of the praia is steep, tumbling down the declivity into the water.

Oil from Turtles' Eggs.

As soon as the eggs have been laid, the Indians, arriving in their canoes from all directions, with their families, build reed huts on the banks—some merely driving poles into the sand, from which to swing their hammocks. The canoes are then drawn up on the beach and thoroughly washed out, while the whole praia is covered with natives with the baskets on their backs in which they collect the eggs. The eggs are then cleansed from the grains of sand adhering to them, and emptied into the canoes, when they are trodden on by the children, much in the same way as grapes are mashed for wine-making. The canoes, when full, are left exposed to the sun's rays, and in a short time a fine clear oil rises to the surface. It is then skimmed off with shells and put into large pots, when it is boiled over the fire and becomes purified. It is next transferred to jars, and is ready for use. It is finer and clearer than that produced from olives.

Meantime, any stray turtles which have delayed their departure, as frequently happens, are turned over on their backs. Holes are dug in the sand near the water, in which the young turtles are kept till required for eating. When not actually employed in picking up eggs or catching turtles, the whole population are engaged in feasting off them—an enormous quantity being thus consumed. The flesh of the animals is cut up and dressed in the shells, which serve as pots, without the danger of burning; and it is washed down with copious draughts of chica.

The female turtles contain an enormous number of eggs, apparently ready to be laid during a succession of years—from the large ones covered with a white membrane, down to a confused mass resembling mustard-seeds. As it requires five thousand to fill a jar of oil, and as many thousands of jars are collected, it may be conceived what an enormous number of eggs are deposited every year. Were it not that many turtles lay in solitary places, which the Indians have not discovered, the rivers would soon be depopulated. The Indian children watch for

the creatures as soon as they are hatched, and collect great numbers.

Humboldt calculates that nearly a million turtles annually deposit their eggs on the banks of the Lower Orinoco. In the Amazon, already the turtles have greatly decreased in numbers; and Bates states that, where formerly he could buy one for ninepence, he could with difficulty procure them latterly for eight or nine shillings each. Every house on the banks has a little pond, called a corral, or pen, in the back-yard, to hold a stock of large turtle during the wet months, till a fresh supply can be procured in the dry season.

The tracaja, or smaller kind, which lays its eggs a month earlier than the larger species, seldom lives, in captivity, beyond a few days.

The natives cook the turtles in various ways. The entrails make a delicious soup, called *sarapatel*; while the flesh of the breast is mixed with farina, and roasted in the breast shell over the fire. Steaks, cooked with fat, make another dish; and large sausages, composed of the thick-coated stomach, filled with mince-meat, and boiled, are considered great delicacies. Bates, however, found, that though the flesh is very tender, palatable, and wholesome, it becomes cloying after a person has lived on it for some time; and he at length could not bear the smell, even though suffering from hunger.

Fishing-Nets and Baskets.

The tribes on the River Uape's use several kinds of bows, some from five to six feet long,—the arrows being still longer. The shaft is made of the flower-stalk of the arrow-grass. The head is composed of hard wood pointed, and sometimes armed with a serrated spine of the ray-fish, covered thickly with poison, and notched, so as easily to break off—a most deadly weapon. Their arrows for shooting fish are armed with iron heads, while smaller arrows are used for shooting small game. These alone have feathers at the base, generally from the wings of the macaw. They are secured spirally, forming thus a little screw on the base of the arrow, causing it to revolve rapidly, and assisting to keep it in a direct course.

They employ also several sorts of hand-nets for catching fish: one is very similar to the folding nets of entomologists, and another is like a landing net. Rods and lines are generally used by them. They also catch fish by means of a small conical-

shaped wicker basket. The larger end is completely open. Into this, which is placed in a current, the fish enter, and swimming rapidly on, jam themselves into the narrow end, where, unable to turn, they are completely secured. They also use large cylindrical baskets, with reversed cones in the mouth like those of lobster-pots, but of much greater size.

Fish are also caught by means of weirs. These are well built, supported by strong posts. They are formed when the water is low. As the water rises, the fish, keeping by the sides of the stream, are guided by the side wings of the weir into its narrow opening, out of which they cannot make their way. Not only fish, but turtles find their way into these weirs, and sometimes electric eels—as also those dreaded fish, the piranhas. The Indian gets the fish out by diving into the weir armed with a small hand-net, and sometimes with a knife. He first endeavours, however, to learn whether any of his foes are within, and gets them out first. Another kind of weir is formed on a still larger scale, generally beneath cataracts or waterfalls. It is similar to the eel-traps sometimes used at mills. As the water pours into it, the fish are often caught in great numbers. These traps, however, require a considerable amount of ingenuity and a great exertion of strength for their construction, as large timbers must be used, to withstand the strength of the current.

Canoes.

Most of the tribes make their canoes out of single trees, which they hollow and expand by means of a fire placed beneath them, gradually inserting wedges and cross-pieces. It is first reared on trestles, with a slit downwards over the fire—which is kept up for seven or eight hours. The process requires great and constant attention, to avoid cracks, and make the canoe bend with the proper dip at the two ends. Additional planks are often secured to the sides, while the stem and stern are formed of semicircular boards pegged on to the ends of the trunk. The seams are then caulked with gum. The paddles have oval blades, and are about three feet in length, cut out of single pieces.

Musical Instruments.

A somewhat complicated musical instrument, consisting of twelve pipes or trumpets, made of bamboos fastened together, with trumpet-shaped mouthpieces of bark, is used by one tribe of Indians. The sounds are not disagreeable, resembling

somewhat clarionets and bassoons. No woman, however, is allowed to see them; and as soon as they are brought out, all the females hurry off to hide themselves. Should any one attempt to observe the mysterious instrument, she is immediately put to death,—generally by poison. A father or a husband would not hesitate on such an occasion to sacrifice his daughter or wife.

The Indians of the Uapes manufacture with great neatness a variety of articles, such as fine hammocks, baskets, and gourds—which they paint with elegant devices; also earthenware water-pitchers and pans for cooking, and clay ovens. They also show skill in making several musical instruments—like fifes and whistles, as also drums—and all sorts of ornaments for the person. Their feather dresses are remarkable for their elegance and the labour bestowed on them.

The Purupurus, one of the most savage tribes, have an instrument—employed by no others—called the palheta. It is a piece of wood with a projection at the end, in which the base of the arrow is secured. The arrow is held with the handle of the palheta in the hand, and thus thrown as a stone from a sling. The natives exhibit wonderful dexterity in the use of this weapon, and with the greatest facility kill birds, fish, and game of all sorts with it.

Part 4—Chapter I.

Northern Regions of South America.

Venezuela.

New Granada is almost entirely a mountain region, occupied by the northern end of the Andes, except where it slopes down towards the Isthmus of Panama and the Caribbean Sea. Venezuela, however, contains three distinct zones or characters of country—mountains, forests, and open plains. The mountain regions, which are also three in number, are separated by wide plains. On the west, the mountains belong to the Andes—being spurs of that range—a large portion consisting of table-lands, called paramos, from 10,000 to 14,000 feet above the sea-level. Among them lies the Lake of Maracaibo, ninety-two miles in length, and eighty-two in width—the largest in South America. On the north-east is the Sierra de Bergantin, and in

the south-east the Sierra de Parima. The forests extend from the Orinoco southward, joining that of the Amazon—a vast tract, but seldom penetrated by the traveller.

The natives call the three zones into which they divide their country the Tierras Calidas, or hot countries—rising not more than 2000 feet above the sea, and in which only tropical plants and fruits flourish; the Tierras Templadas, or temperate country—from 2000 to 7000 feet above the sea, where the agricultural productions of Europe succeed best; and the Tierras Frias, or cold countries—which rise above the former, to the height of 15,000 feet, the summits of the mountains reaching 148 feet above the snow-line.

Two seasons exist in the tropics, into which the year is divided—the wet and the dry. Though the heat is greatest in the former, it is called winter, as the sun then passes twice over the zenith; while during the dry season, which is called summer, the sun is in the southern hemisphere. During the whole year the north-east trade-wind blows across the country, but modified in direction and force by these seasons.

In consequence of the very different elevations of the land, the productions of nearly all parts of the world can here be cultivated successfully. In the hot districts, chiefly bordered by the sea, cotton, indigo, cacao, coffee, sugar, tobacco, and cocoa-nuts come to perfection. The cocoa-palm, enjoying the advantage of the sea-breeze, here grows to a height of seven hundred feet above the ocean. No tobacco surpasses that of the well-known Varina. Barley and millet, as well as wheat, are produced on the more elevated tracts; while maize is cultivated all over the country.

The wide-extending marshes and pools are frequented by pelicans, herons, and wild geese, ducks, and flamingoes; while other birds—chiefly belonging to the Falconidae, Ardeidae, Strigidae, and Psittacidae—are numerous. The savage alligator and fearful anaconda abound in all the rivers and lakes; while the jaguar, puma, ounce, tiger-cat, monkey, tapir, capybara, porcupine, wild hog, sloth, and ant-eater range through its forests and savannahs.

Numerous tribes of the aborigines, driven back by the whites, exist in the remoter districts. They are generally of a dark copper colour, while some are of a lighter hue; and though building huts, most of them go almost naked. They exist on plantains, yucca, batatas, and the sugar-cane—which they

rudely cultivate; and the fish, as well as the manatees and alligators, which swarm in their waters.

The neighbourhood of the Caraccas is described as a terrestrial paradise, where spring perpetually reigns. In this favoured region, all the fruits of the tropics come to the greatest perfection. The delicious chirimoya takes the first place. It is likened to lumps of flavoured cream, ready to be frozen, suspended from the branches of some fairy tree, amidst an overpowering perfume of flowers—for it is in bearing all the year round. "He who has not tasted the chirimoya fruit, has yet to learn what fruit is," says Markham.

Here, too, the grandilla, in shape like a water-melon, hangs from its delicate tendrils. When cut open, it is found filled with a juice-like nectar, having the flavour of the strawberry and peach. A species, of cactus—the nopal—produces the tuna or Indian fig.

It is on the fleshy, downy stems of the cactus that the cochineal insect is reared, producing the valuable crimson dyes which outshine the vaunted productions of Tyre; and from the same family of plants rises the magnificent pitahaya,—“those flowers known for size and effulgence, which begin to open as the sun declines, and bloom during the night, shedding a delicious fragrance, and offering their brimful goblets, filled with nectareous juice, to thousands of moths and other crepuscular and nocturnal insects,” as Gosse describes it.

The splendid mammey apple-tree (*Mammea Americana*), which bears numbers of round and heavy fruits, brown outside, and of a golden yellow within, valued for the marmalades and other delicacies formed from them.

Of the same family as the chirimoya is the guanabana (*Anona muricata*), or sour sop, an unattractive name for so delicious a fruit. From it a cooling drink is made, and ices of fine flavour.

A near relative is the custard apple, filled with a ruddy compounded substance, which no cook can surpass. As also the riñon (*Anona squamosa*), a kidney-like fruit in form, with a custard-like interior.

The superb alligator-pear, more properly called percia gratissima; its first name given probably from its being indigenous to a country abounding in saurian reptiles, otherwise it is difficult to account for its inappropriate designation. It resembles in shape a large pear; but the interior of its rind is

lined with a marrow-like substance of a yellowish colour, somewhat like butter, and used at the breakfast-table.

Among other products is the tamarind, unrivalled either as regards beauty of foliage, brilliancy of blossoms, or the delicacy of its acidulous pulpy pods. In blossom the tree is a lovely object. Amid its feathery dark green foliage issue, in vast numbers, golden yellow branches with delicate flowers dazzling to the eye; while its fruits in a green state form a candied sweetmeat, or when ripe, and made into a decoction, a refreshing drink for fever-stricken patients.

The inaja-palm, of various species, produces pellucid pods, from one to two feet in length, containing a row of beans—enveloped in white cottony pulp—grateful to the taste.

The cocoa-palm, though at a distance from the coast, here flourishes in great perfection, adding to the splendour of the vegetation, with its glorious crown of monster leaves; while the plantain and banana are widely cultivated, a few plants of which are sufficient to supply a family with bread, vegetables, fruit, and preserves of various kinds. Humboldt observes that an area planted with plantains produces nearly twenty times as much food as the same space sown with corn.

Humming-Birds.

Amid this rich and varied vegetation, swarms of tiny and brilliant humming-birds flutter round the masses of highly-scented blossoms that perfume the air, and which might be mistaken by the stranger at first sight for some of the metallic-coloured beetles which dispute with them the nectar of the fragrant flowers, so brilliant is the lustre shed by both. As Gosse well remarks: "For that peculiar charm which resides in flashing light, combined with the most brilliant colours, the lustre of precious stones, there are no birds, no creatures, that can compare with the humming-birds, confined exclusively to America." These lovely little winged gems were to the Mexican and Peruvian Indians the very quintessence of beauty; and were called by various names, signifying "the rays of the sun," and the like. Fully four hundred distinct species of these winged gems are supposed to exist on the continent.

Trees.

Of the trees which have a wide range over the country, especially near the sea-coast, the *lignum vitae* is of great value.

As from its hard nature it turns the edge of the best-tempered tools, it serves for the construction of wharves, as well as for the keels of ships,—the attacks of the teredo, or sea-worm, being futile upon the iron network of its fibres. It can remain under water for an indefinite period without rotting, and eventually becomes petrified.

Here the guayacan, or guayacum of the arts, is found in great abundance.

The alcornoque, a beautiful tree, scarcely inferior to it, here raises its graceful head above the rest, affording the cattle a permanent shade during the dry season; while in the Llanos it is used in the construction of houses and fences.

The Brazileto-wood tree grows in abundance, producing a beautiful dye.

Among others is the tree which yields the precious balsam of copaiba,—extracted by making incisions in the trunk, when the resinous fluid pours forth.

The natives form their piroques or canoes from the last which we will mention, the tacamahaca (the *Elaphrium tornentosium*), which here attains great dimensions. The bark is of the nature of the birch-bark of North America, and is stripped off the trees in a similar manner, the huge sheets being joined at the extremities by means of slender vines, while the interstices are filled with resin to keep out the water—the whole being then bound with stronger vines, and several sticks being fixed between the borders to prevent the bark from collapsing. The resin of this tree, an opaque lemon-coloured substance, resembles wax; and when mixed with algoroba, it forms a torch which burns with great brilliancy, and emits a delicious odour.

The vast Llanos, already mentioned, in the north cover a surface of about 110,600 square miles. Over a large portion of this wide-extending region, even the wild Indian, there unable to find subsistence, but seldom roamed; and thus for ages it remained a howling wilderness, inhabited, and that only at certain seasons, by the jaguar, the peccary, the agouti, and the timid deer. Here, when the summer sun sends down its burning rays day after day from a cloudless sky, the grass withered and shrivelled by its heat, the plain presents the appearance of a desert waste. No cooling breeze passes across it, no shelter is found from the scorching heat. The pools are dried-up, the surface of the swamps becomes cracked and dry—the brown stalks of the tall reeds alone marking the nature of the ground.

Here, occasionally, when the blast sweeps across the plain, columns of dust are set in motion, like those of the African Sahara, overwhelming and stifling the incautious traveller, who is hurled senseless to the ground.

Here, too, as in other desert regions, the mirage mocks him as he journeys across it parched with thirst—often assuming a semblance of the ocean, slowly moving in wave-like undulations.

The few trees and shrubs which here and there rise from the plain assume a greyish-yellow tint, showing that the sap which has hitherto nourished their leaves has ceased to flow,—stopped by the burning heat, which has dried-up every particle of moisture from which they are wont to obtain nourishment. At this season even the animals take their departure; here and there the alligator and anaconda alone remain, in a torpid state, buried in the clay of the dried-up swamps.

The traveller who ventures across this arid region has not only to encounter the breath of the simoom, the sufferings of burning thirst, the attacks of wild beasts, the bite of the matabello—which may kill his steed and leave him helpless—and many other dangers, but, more fearful than all, flames caused by some camp-fire incautiously left burning, seizing the parched vegetation, traverse the plain with inconceivable rapidity. He and his Indian guides, without whom he could not venture across it, discover far-away on the horizon columns of smoke ascending to the skies. The Indians, standing up in their stirrups, gaze at it anxiously for a moment to watch its direction, and then pressing their steeds to their utmost speed, urge him to fly for life. At first he can scarcely believe that yon distant line of smoke is menacing them with danger; but soon onwards it comes, the burning torrent rolling rapidly towards them. Now and then they turn their heads to watch its progress. In vain they look out in every direction for a darker patch in the plain, which may indicate a water pool, and amid which they may seek refuge. None appears. On they rush, urging their horses by whip and spur—their steeds seeming to know their danger. Already they see the bright glare of the flames below the dark mass of smoke. Already the bursting and crackling of the leaves, as the threatening column rushes on, reaches their ears. A fearful death is following them. At length the sharp eyes of one of the guides discover a slight eminence; towards this, though almost despairing of safety, they direct their course. They reach its base. It is but thinly covered with vegetation. Scarcely have they urged up their panting horses to the summit

than the flames overtake them. And now the sea of fire rolls its devouring billows around, and the suffocating smoke, striking in their faces, compels them to fall on the ground, in the hope of obtaining sufficient air for breathing, till the flames have passed by. The fire mounts the hill, but happily, finding little nourishment, is speedily extinguished. And now the waving mass, rolling onwards, recedes further and further from their gaze.

Whole swarms of voracious vultures follow in circling flight the smoky column, like so many hungry jackals, and pounce upon the snakes and lizards which the blaze has stifled and half calcined in its murderous embrace. Then, with the rapidity of lightning, they dart on their prey and disappear in the clouds of smoke, as if they were voluntarily devoting themselves to a fiery death. Soon the deafening noise of the conflagration ceases, and the dense black clouds in the distance are the only signs that the flames are still proceeding on their devastating path over the wide waste of the savannah.

The travellers thus happily saved may now proceed on their course, provided they have a supply of water for themselves, and have certain information of the existence of some deep pool at which their steeds may quench their thirst. Let them be cautious, however, how they approach the pool; for beneath its surface the alligator and anaconda lie hid, or the electric eel—which with its powerful galvanic battery may strike the steed which ventures within its reach.

Even in this arid region the bountiful Creator has not left his creatures without the means of sustaining life. Here, on the driest soil, the globular melon-cactus, measuring a foot in diameter, flourishes; its tough and prickly skin surrounding a rich and juicy pulp. It is, however, covered with long, sharp thorns, which must be broken off before the refreshing juice can be obtained. It is curious that the wild horse and ox—strangers, as it were, to the region—are not possessed of the sagacity to do this; while the mule, when it discovers the melon, sets to work at once with its fore-feet, and then cautiously sips the refreshing liquid.

Day after day the sun, with a lurid glare spread far and wide over the cloudless sky, rises above the arid plains, drawing up every particle of moisture, and withering with the intense heat of his rays every blade of grass and green leaf, till it seems as if the whole region were doomed to eternal desolation. At length, however, a wonderful change takes place over the hitherto arid waste. A thick veil of mist is drawn across the blue sky. A low

bank of clouds appears on the horizon. Gradually it rises, assuming the form of distant mountain-chains above the plain. Onwards it advances, increasing in density, while vivid flashes of lightning dart forth; the thunder is heard rolling in the distance, and now loud crashing peals burst from the clouds, which rapidly spreading across the vault of heaven, plenteous showers rush downwards on the parched earth, filling up the dry cracks in the marshes, replenishing the pools, and swelling the streams. The grass springs up on every long-dry spot, the leaves burst forth, while thousands of flowers of every tint and hue enamel the plain; and, as if by magic, the whole face of nature is in a few hours changed. In a short time the thorny bushes of the delicate and feathery-foliaged mimosas are loaded with masses of canary-coloured blossoms, from their summits down to the lowest branches, sending forth an almost overpowering perfume; while the fronds of the beautiful mauritias—the palm of the Llanos—rising to the height of one hundred feet above the plain, sprout forth in rich luxuriance.

Animal life, too, wakes up. The savage alligator and the huge anaconda crawl forth from the bed of clay in which they have passed their summer sleep, in search of prey; ibises, cranes, flamingoes, and numberless water-fowl, swarm on the newly-formed pools; the cattle of the Llaneros luxuriate in the abundant grasses which everywhere appear; while multitudes of insects crawl forth, seeking refuge from the flood in the higher grounds. The swollen rivers now inundate the plains, and the spots where the cattle wandered in vain to quench their thirst can now be passed for miles together by boats; and alligators lie in wait to seize in their savage jaws the horses and oxen compelled to swim across the flooded land in search of pasture.

The Llaneros.

Sterile as the Llanos appear during the dry season, numerous cattle-farms exist, scattered widely over large portions. The Llaneros, as the inhabitants are called—descendants of the white settlers, with an admixture of Indians and blacks—are a hardy, bold race, living almost entirely on horseback, engaged in watching over their herds, and in battling with the spotted jaguar, the savage cayman, the huge boa and anaconda, and occasionally the fierce natives of the surrounding deserts. Often, too, they have to struggle for their lives against the sudden inroads of the vast inundations which sweep off their herds and frail habitations. Armed with their unerring lasso and garrocha, or sharp lance, blunderbuss and sword, they fear no foes. These lances, formed of the tough stem of a small palm,

are weapons of no slight importance to them. They are sharpened to a point at one end, and hardened in the fire, or sometimes have an iron head. Round the point a number of loose metal rings are secured, which when shaken produce a loud rattling sound.

See a band of these hardy horsemen in chase of the wild cattle which roam at large over the plains. In bands of six or ten, they form a circle of fifteen miles or so in circumference—bivouacking during the previous night at their respective stations. At early dawn they mount their horses; and now, shouting and shrieking, with their lasso coiled before them on their saddle, and their garrocha in their hand, whirled round and round, they advance, closing in towards the centre of the circle, and driving before them all the animals they meet. The animals, terrified by the cries and whirling spears, dash madly forward,—some endeavouring to break away from the circle, when they are speedily turned back by the sharp goads of the horsemen. Not only the cattle, but wild boars, deer, and other quadrupeds, starting up from the ground where they have been resting, dash on amid the confused herd. And now perhaps several thousand head of cattle are collected within the circle formed by a hundred or more horsemen. If a fierce bull, turning round, ventures to encounter them, they shake their rattling spears in his ears, and quickly again turn him.

When a bull is overtaken, the Llanero thrusts the point of his spear into the animal's shoulder, and, leaning forward with the whole weight of his body upon the shaft, overthrows the savage creature, who rolls headlong on the plain, where he is quickly secured. Sometimes a fiercer bull than ordinary charges the horsemen, who fly on either side; but wheeling round speedily, with their lassos whirling round their heads, the noose is thrown over the animal's horns, and the well-trained steeds assisting their riders, he is speedily brought to the ground. A hole being then pierced in the thick cartilage of the nostrils, a thong is passed through it, the other end being fastened to the horse's tail. A jerk quickly brings the bull to his feet, and he is led off a captive.

A still bolder manoeuvre is accomplished by the expert horseman. Galloping after the bull, the rider seizes the animal's tail, giving it a turn round his own wrist, and then again urges forward his horse till both are at full speed, when, suddenly turning in an oblique direction, by a powerful jerk—from the impetuosity imparted by their rapid speed—the bull is brought to the ground. Here, too, the horse, knowing what is about to

be done, starts forward at the proper moment, and assists in accomplishing the work. Sometimes the daring Llanero will throw himself from his seat, still holding on to the tail of the bull, and seldom fails ultimately to overthrow it.

The whole scene is one of the wildest confusion. Clouds of dust rise from the dry plain, trampled on by the hoofs of numberless animals. The bulls, driven to fury, tear up the earth, and with deep, savage bellowings rush at their fellows as well as at their foes, unable to distinguish one from the other—often piercing the former with their sharp horns. The uproar is increased by the yells and shouts of the Llaneros galloping in all directions over the ground, rattling their garrochas, waving their ponchos, and whirling their lassos. Yet further to increase the turmoil and uproar, flocks of cranes and herons, startled by the hoofs of the horses and shouts of the riders as they rush onward, rise from the stunted frees of a neighbouring marsh, with loud cries and clashing of wings, into the air, hovering above the heads of the actors in such numbers as almost to darken the sky as they circle round and round.

The object of the hunt is to separate the cattle of the different owners, and to drive them into their respective corrals or majadas. Tame cattle are employed to assist in the operation, and are stationed at various places round the circle. The horsemen, dashing in among the mass of excited animals, fearless of the points of their sharp horns, drive out with their lances those they recognise as their own property—known by the notches on their ears—goading them with their lances. The animals, now separated with wonderful skill, are, with their calves, urged towards the groups of their well-trained kindred, who lead them on towards the destined corral. Often, however, suspecting treachery, they turn round and attempt to escape, rushing with mad fury towards the horsemen—many of whose steeds are thus pierced by their horns, and the riders, overthrown, with difficulty escaping.

Thus they at length reach the entrance of the corral, which is in the shape of a funnel, composed of stout posts strengthened by thick rafters. Here the most desperate struggle often ensues; but the bulls are met by an array of the rattling garrochas; and though some may escape at the last, the great mass are, by the skill of the Llaneros, at length secured within the corral,—many of the cattle receiving desperate wounds.

These farms of the Llanos, built in the roughest and most primitive style, are surrounded by fences, intended not only to resist the rush of a herd of cattle, but the attack of human foes.

The inclosures are formed of huge trunks of trees, driven close together into the ground. It would seem difficult to account for the way in which they are brought across the plain. This is done, however, during the inundation of the savannahs, when they are transported to the spot on rafts made of lighter wood,—the timbers themselves being composed of a species of acacia of extreme hardness, and from their nature capable of resisting the effects of alternation of climate for many years. Many of these corrals are sufficiently spacious to contain three thousand head of cattle.

When the animal is to be caught for slaughter, the horsemen go in chase, the one securing it by his lasso over its head and dragging it along, while the other urges it on with his garrocha till it reaches the slaughter-post. The first then secures the animal by a few turns of the lasso round it, while a matador strikes his dagger into the vertebrae at the back of the head, when the animal drops as if struck by an electric spark.

These wild horsemen, when crossing a river, hesitate not to plunge in, in spite of the alligators which may be swarming on every side. While their clothes are carried across in a hide-formed canoe, put together at the moment, they dash into the stream without clothes or saddles, and then slipping from the backs of their horses, support themselves on the animals' haunches with one hand, while they guide them by means of the halter with the other—their companions on the shore shouting, yelling, and shaking their ponchos, to drive the rest of the herd into the water. The caymans, alarmed by the uproar, keep at a distance; but the savage little caribes frequently attack them, and many thus fall.

Besides cattle, horses, and mules, vast numbers of hogs range over the plain,—the descendants of those introduced by the early settlers, and which are now, from their ferocity, and the formidable size of their tusks, considered foes worthy of the lances of the bold horsemen. These lances, generally used in hunting, have played no insignificant part in the hands of the Llaneros, as well as in those of some of the fierce tribes of the desert, during the civil wars which so long disturbed the country.

A profusion of fruits in a state of nature grow in the woods and plains. Among them are several species of wild guavas. Some are of exquisite flavour and aroma. One sort bears in rich profusion a number of brilliant scarlet, highly perfumed, and acidulous fruits. There are various kinds of custard apples, the inside a sweet and highly aromatic pulp filled with small seeds.

Also the *madroña*, which resembles the lemon in shape and colour, and filled with a pulp enveloping several large nuts, the flavour not unlike strawberries. The tree which produces these fruits attains a height of sixty feet, and has a dense foliage of a brilliant green.

On a vine grows the monkey cacao bean, which these animals eagerly devour.

There are many leguminous trees, some bearing pods ten inches long, filled with rows of black beans enveloped in a snow-white and agreeably sweet pulp. Here also is the *algarobo*, or locust-tree of the New World; bearing pods filled with beans surrounded by a sweet farinaceous substance, of a highly nutritious quality.

Indeed, Venezuela is behind no other region of the world in the variety and quality of its natural productions.

Part 4—Chapter II.

Guiana.

A wide belt of low land borders the ocean side of Guiana on the north-east of the continent, where white men dwell, in houses elevated on piles of timber, among sugar-estates and cotton-plantations, tall windmills, and numerous canals crowded with shipping, which would present a thoroughly Dutch scene were it not for the stately cocoa-nut and cabbage-palms rising amid them, the dark-skinned labourers, the blue sky, and burning heat. The province is, however, for the most part a region of rugged mountains, dense forests, open savannahs, broad streams, cataracts, waterfalls, and rapids; where the yet untamed savage, making war on his neighbours, and sunk in the grossest barbarism, lives as his predecessors have done for centuries past.

Through the centre of the territory flows the Essequibo, the largest river between the Amazon and the Orinoco. Its source is among the same mountains which give birth to some of the tributaries of those mighty rivers, the one running to the north, the other to the south; thus adding to the wonderful network which unites the waters of South America.

It was through this region that the gallant Raleigh, and many bands of Spanish adventurers in succession, in spite of the most terrific dangers and difficulties, fought their way amid hostile natives in search of the far-famed El Dorado. Among the first bands was that led by the celebrated Philip Von Hutten. They had heard that in the interior of the country there existed a golden region, surpassing even the wildest descriptions of that of Peru. It was said that some of the royal race of the Incas, escaping from their Spanish invaders, had established a new dynasty amid the mountains, on the shores of a beautiful lake, the sands of which contained gold in prodigious quantities. The houses of his capital were covered with plates of gold. The vessels of the royal palace were of the same metal; and so abundant was it, that the natives, anointing their bodies with a glutinous substance, sprinkled them over with the dust. The person of the sovereign was especially thus adorned by his attendants. Oviedo remarks—"As this kind of garment would be uneasy whilst sleeping, the prince washes himself every evening, and is gilded afresh in the morning;" thus proving that the empire of El Dorado is infinitely rich in mines.

Von Hutten and his band, after desperate fighting, were compelled to retire, just as they believed they had seen in the far-off distance the shining roofs of the splendid city. Their leader was preparing another expedition when he fell by the hand of an assassin.

Notwithstanding the dangers to be encountered from the fierce Caribs—who, sheltered by trees and rocks everywhere, attacked their foes with poisoned arrows—and the numerous disappointments which occurred, fresh bands of adventurers, age after age, still believing in the fabled wealth which was to be their prize should they succeed, set forth, in hope of reaching the wonderful city. Some of Sir Walter Raleigh's followers declared, indeed, that they saw rocks shining brightly with gold, and a mountain containing diamonds and other valuable stones, the lustre of which blazed forth to a considerable distance.

Every marvellous fable found belief. The crew of an English ship, about that time exploring the Marowayne, stated that they had seen on its banks a gigantic race of men, who carried in their hands bows made of gold. Wherever mica was seen glittering on the side of a mountain, it was supposed to be the same precious metal. Sir Walter Raleigh sent his faithful lieutenant, Captain Keymis, to carry on the expedition he was himself unable to undertake. His chief object, and that of his

successors, was to discover the site of the golden city. Keymis, while sailing up the Essequibo, heard that by ascending one of its tributaries—the Rupunoony—he would certainly reach it.

Numerous other expeditions were organised by Spaniards and Portuguese. Many of the unfortunate adventurers fell by the hands of the natives, others by famine and fatigue; and as late as the year 1776 a large band set forth, when many hundreds perished, one man only returning to tell the sad fate of his companions.


At length, in the quarter to which Captain Keymis had been directed, the small lake of Amucu was discovered, to which a river called the Parinia is connected; and from the geological structure of the surrounding country, is supposed to have been formerly much larger than at present. Within and around it are islands and, rocks of mica, slate, and talc; “the materials,” observes Humboldt, “out of which has been formed that gorgeous capital, whose temples and houses were overlaid with beaten plates of gold.” Schombergh, who visited the lake, agrees with the German philosopher. Another traveller, Hillhouse, in 1830 ascended the Masaruni, which flows from the northern side of the mountains of Roraima, among which the lake is situated; and believes that its romantic valley was once the bed of a large lake twelve miles in width, and upwards of one hundred miles in length,—which long ago burst its barriers and gave rise to the fable still preserved among the Indians, and, till within almost the present century, believed in by the colonists themselves.

Rivers:—The Essequibo.

Let us take a glance over some of the rivers of the land.

The Essequibo, called by the Indians the “younger brother of the Orinoco,” first claims attention. The mouth has rather the appearance of a vast lake than a river, its shores bordered by thick groves of that tree of curious structure, the mangrove, whose roots or seeds, borne on the ocean wave, strike wherever they can find a muddy soil, throughout every part of the tropics. Rising upwards on the roots, which it shoots downwards as it grows, the base of its stem is often six or eight feet from the ground—the stem itself seldom more than a foot in diameter, and from fifteen to twenty feet in height. Its thick stiff ribs, about eight inches long and nine inches wide, are of a dark sombre hue. This broad estuary, extending inland for thirty miles or more, with numerous picturesque islands covered by

tropical vegetation rising out of it, is joined by the united streams of the Masaruni and Cuyuni, its own and their romantic waterfalls making a continuous navigation up them impossible. Yet, notwithstanding its impediments, these rivers afford the only means of communication, except along the foot-tracks of the Indians, through the dense forests, into the far-off interior. These forests commence in many parts close to the ocean, spreading often for thousands of square miles, broken sometimes by swamps, and at others by wide savannahs, open spaces covered with grasses, and here and there clumps of trees. Even the sand-hills of moderate height bordering the Atlantic are clothed by the superb vegetation of the tropics,—the forest extending to, and even climbing up the sides of the Rocky Mountains. Vast timber trees, the purple and green heart,

the stately mora, the locust-tree, raise their heads above  their smaller brethren, conquering in the struggle for room to allow their foliage to expand; while below, the moist carpet of fallen leaves, fungi, and moss, increases the richness of the vegetation. Here also are numerous graceful palms,—the cocorite, from which the Indians form their poisoned arrows; the troali, with broad and long leaves, used for thatching their huts. The graceful manicol, rising to a great height, bends, like the weeping willow, its slender stem over the stream; and, with several other species of palm, it affords the succulent cabbage. Beautiful parasites hang in every direction from the trunks and boughs—sipos ascending and clinging in intricate network, interlacing the trunks and branches, and often supporting the remnants of the trees they themselves by their fatal embrace have destroyed; indeed, the same style of forest here exists as throughout the Valley of the Amazon.

As the flora is much the same on a similar altitude, so there is little difference in the fauna, although some species are found in Guiana which are unknown in the latter region. The native tribes, however—the red men of the wilds—differ considerably. Near the supposed site of the famed El Dorado at Pirara, situated on the borders of Brazil, some thirty years ago, an attempt was made to carry, not the gold that perishes, but the joyful news of salvation, to the long-benighted Indians in that region. It was blessed, and was prospering greatly, and gave promise of the speedy conversion of the Macusi tribe and others, when some Brazilian Roman Catholic priests, hearing of it, determined on its destruction, and induced their government to claim the region as Brazilian territory. A detachment of militia was despatched, and took possession of the village. The Indians, fearing lest the Brazilians might conduct them into

slavery, dispersed into the forests and mountains, while the missionary with difficulty escaped with his life.

The distance to be traversed from the British capital of George Town to Pirara is about three hundred miles; and though the scenery is of that enchanting character which, as the enthusiastic Waterton describes it, made his soul overflow with joy, and roam in fancy through fairyland, yet, as it is through an almost uninhabited country, with numerous rapids and torrents, woods to be traversed, and mountains to be climbed, the difficulties are not contemptible.

"To surmount these obstacles to navigation," say Mr Brett, "it is necessary in some places to carry or haul the canoe overland at the sides of the fall. At others, advantage is taken of the eddies which are found at the base, and huge rocks that intercept the stream. The Indians pass from rock to rock by leaping, wading, or swimming, and, by means of a hawser, haul the boat through the rushing water from one resting-point to another, the steersman keeping his seat, and—sometimes lashed to it—striving with his large paddle to guide in some degree her course. The roar of the water dashing and foaming against the surrounding rocks renders this operation as exciting as it is difficult. Still more exciting and difficult is the task of descending these rapids. The safety of all then depends on their perfect steadiness, and on the bowman and steersman acting in concert, and with instant decision. The canoe is kept in the very centre of the current, one of her best hands kneeling with quick eye and ready paddles in the bow, and the rest of the crew exerting their strength to give her headway. Darting swiftly along, she arrives at the head of the fall, and bounding downward, shoots into the surf below it, dashing it up on either side, and leaving her crew alone visible. If all be well, rising above the foam, she obeys the guiding paddles in stem and stern, and dances over the tumbling waves, while her excited crew exult at their success. Whole families, however, even of Indians, are sometimes drowned; and in 1805 Captain Beresford, son-in-law of the governor, and four other gentlemen, with two of their crew, lost their lives in shooting the lower falls of the Masaruni."

The Berbice River.

On the Berbice, which falls into the Atlantic about sixty miles eastward of George Town, the falls and rapids—which do not, however, reach to within one hundred and sixty miles of its mouth—are very numerous. While the scenery round them is

highly picturesque, they are extremely dangerous. Here is found the cascade of Idurewadde; and higher up, the cataract of Itabru. Above these again are more than forty falls and rapids, called by Schombergh the Christmas Cataracts, and which cost him and his companions immense labour to surmount. On their return, one of the party, rashly standing on the thwarts of the canoe while shooting the falls, upset it and was drowned.

Huge caymans abound in the river, and lie like logs of wood at the foot of the cataracts or rapids, watching stealthily to catch and swallow whatever the fierce current may bring down to them.

Above these falls is a lagoon, on which he discovered the now far-famed Victoria Regia, before that time unknown to the world. At the head of the Masaruni rises Mount Roraima, 7540 feet in height. It is the principal watershed, from which various streams flow in different directions into the three great rivers—Amazon, Orinoco, and Essequibo. Hillhouse and Schombergh describe the side of the mountain as composed of cliffs, fifteen hundred feet in height, of compact sandstone, as perpendicular as if erected with the plumb-line, and overhung in part with low shrubs. Though distant, they appear as if in dangerous proximity. Around are detached masses, apparently torn from those gigantic walls of nature; and every moment it seems as if one of them would block up the path, or cut off all retreat. In places the channel of the stream is so narrow that the canoe can hardly pass, in others it widens out into a shallow claret-coloured lake. At length a capacious basin is entered, black as ink, surrounded by a bold and extensive shore as white as chalk. The roar of the water is heard, but no current perceived; though there is a foam-like yeast on the surface, which remains all day without visible alteration. At length, in the distance, a broken white line is seen struggling through a cluster of granite rocks at the base of two quartz cliffs of a mixed character. This is the fall of Macrebah.

The Arecuna Indians.

In those mountain regions dwell the Arecunas, a fine sturdy race—with clear copper-tinted skins—unencumbered by clothing, though wearing feathers and other ornaments; long sticks through the cartilage of their nostrils, and still longer, richly adorned with tufts of black feathers, through their ears. Both sexes are much tattooed; some of the women having dark blue lines across the upper lip, and extending in wavy curves over each cheek, looking like enormous curled moustaches.

Others have a broad line round the mouth, which gives it the appearance of being far larger than it is in reality. The men wear the heads of humming-birds and of a bird of a beautiful blue colour in their ears; and round their waist, girdles of monkey's hair.

Schombergh, who visited them, says they made a great feast in his honour, when there was a grand display of gorgeous plumes, and head-dresses,—the whole winged tribe having apparently been put in requisition to furnish forth the most brilliant of their feathers. They had also necklaces of the teeth of monkeys and peccaries, and porcupines' quills; to which were attached long cotton fringes—which hung down their backs, and to which toucan and other skins were suspended securely. Feasting and dancing, kept up by the natives thus dressed, lasted the whole night; and the constantly-repeated burden of their song was—"Roraima of the red rock, wrapped in clouds, the ever-fertile source of streams."

The Corentyn River.

Eastward of the Berbice, and greatly inferior in size to the Essequibo, is the Corentyn, which has its source near the equator, and forms the boundary of the British colony. A few Indians of various tribes dwell on its banks near the mouth, but above their last settlement desolation reigns supreme.

On the rocks near its banks may be seen a few rude carvings, the handiwork of a race long passed away. Day after day the voyager on its waters passes amid the wildest and most romantic scenery,—amid numerous islands, rocks, and rapids; but no human beings are seen—not a light canoe on its waters, not an habitation on its banks. At length, after a nine days' voyage, enormous rocks appear heaped together, opposing progress; vast chasms yawn beneath his feet when he lands, and at certain places the streams sink into the earth as if by magic, to reappear where least expected. A thundering noise is heard, and a mist hovers in the air, in which thousands of birds disport themselves,—marking the position of the great cataracts of the Corentyn. The scene, however, is too vast to be beheld in its full grandeur from any single point of view. No waterfall in the territory surpasses them in grandeur.

The fierce Caribs, in the days of their power, inhabited the banks of the river, engaged in carrying into slavery the people of other tribes from far and near; but they, and those they oppressed, have passed away—a few families only of their

descendants remaining here and there—the one to boast of the prowess of their ancestors, the other to tell the tale of their woes.

The Demerara River.

High up the River Demerara—on which George Town, the capital of the colony, is built—where the river forces its way through the dense forest, is a fall of great picturesque beauty. Here, says Mr Brett, the cataract precipitates itself in one body over the rocky barrier; and huge masses of rock, crowned with stately trees, divide it into channels ere it reaches its lower bed. Of these channels, there are two large ones in the centre, with smaller ones on either side. All are filled with great boulders, over which the dark waters toss and dash until they roll into the wide basin below, covering its surface and margin with masses of yeasty foam. The length of the fall appears to be three or four hundred feet, though the perpendicular difference between the levels of the river above and below is sixty-five feet. Three-fourths of this cataract is hid from view by the luxuriant forest which clothes its sides and covers its islands. The misty spray—rising, when the river is full, from the channels between the tall trees—the rushing noise, and a glimpse of the torrent here and there, show imperfectly its divided course. Could a clear view be obtained of it, it would be found to contain a spectacle full of beauty and interest.

Between that point and the Essequibo, with which the Demerara runs parallel, is a remarkable—almost perpendicular—rock called Maboora, the uppermost of a succession of natural terraces. The ascent to the summit from the forest below occupies some hours. From hence the broad Essequibo can be seen flowing, partly hidden by the range of hills. Its face is broken up by the rains of ages into huge boulders, but the top is level. In its western base is a large cavern, having an inner chamber with a narrow entrance. Here the beautiful cock of the rocks, adorned with golden orange tints and double fan-like crest, makes his abode. The nests of these brilliant birds are at some distance from the sandy floor, and attached to the rocky sides.

Native Tribes.

But we must pass from the scenery of this region of cataracts and forests, to take another glance at the wild tribes who inhabit it. The most numerous and ferocious at one time, by far, were the cannibal Caribs; who for ages had inhabited the

country, and were joined by their brethren, driven by the Spaniards from the islands they had long occupied. Whether the whole race had originally come from the north, scattering their bands and taking possession of the islands they passed, seems uncertain.

When Columbus discovered the islands, to which he gave the name of the people, he had full evidence of their courage, ferocity, and cannibal propensities. At the same time, they paid great attention to agriculture, and brought home seeds and plants from the territories they overran. They were in the habit of attacking; other islands and the mainland, and carrying off the women as slaves; making prisoners of the men, to be killed and eaten. Their arms were clubs, and bows and poisoned arrows. Even the women were expert archers, and when their husbands were away remained to defend their homes. The hair of these savages was coarse and long—their eyes, surrounded with paint, giving them a hideous expression; while their limbs were bound with bands of cotton, causing them to swell out into disproportionate size where unconfined. When attacked by the Spaniards, the men refused to be taken alive, and the women defended themselves with the fiercest courage after the death of their husbands.

In the British island of Saint Vincent several bands remained, who devastated the plantations, and committed many atrocities,—especially in the revolutionary war, when they were stirred up by the French. They were removed by the British Government to the island of Ruatan, in the Bay of Honduras, whence they emigrated to the neighbouring coast. Meantime, they were extending their power on the Southern Continent, and became the dominant race on the Orinoco and Essequibo, their excursions reaching even to the provinces watered by the Amazon. Wherever they appeared, the other tribes were driven for refuge to the mountains and forests. They even ventured to attack the white settlers, and endeavoured to drive out the Spaniards from the city of Valencia when first established.

They incessantly attacked the natives on the banks of the Orinoco, sometimes ascending that river in numerous canoes; at other times crossing the highlands, and descending one or other of its tributaries, they would come suddenly on their foes, never failing to exterminate all who were their inferiors in power. They were, however, often fiercely opposed by some other tribes, and vast numbers cut off. During the fearful revolt of the negroes in the Dutch provinces, several tribes of them were engaged by the Dutch Government to assist the whites.

Making their way through the forest, and concealing themselves by day, they would sally forth by night and attack the villages of the revolvers—setting fire to their roofs, and slaughtering the inmates, who fled from their burning habitations.

Sir Walter Raleigh describes them as a naked people, but valiant as any under the sky: and thus they remained, still rude and savage, till the common fate of other tribes overtook them. Powerful as they were, these wild hordes could only fight, overrun, oppress, and destroy; and even in their highest prosperity they were incapable of accomplishing any great and useful work. Up to the close of the last century they were the most numerous, as well as the most warlike, of all the tribes.

Though their chiefs were not hereditary, if a son equalled his father in courage and skill, he succeeded to his power. To attain that office, it was necessary for him to be acquainted with every art and stratagem of savage warfare, and to possess more strength and bravery than the rest of his tribe. When a Carib aspired to be the chief, it was customary to expose him to the biting of ants; and if he could bear the torture without flinching, then he was considered fit for the office.

When a band determined on a predatory excursion, they would often, unlike other tribes, attack their enemies in the daytime, paddling their canoes against the current in order that the sound of their paddles should be heard by their enemies, and allow them time to prepare for battle. That they were cannibals, there appears no doubt; at least, they feasted on their enemies taken in battle, whose flesh they tore and devoured with the avidity of wolves. The men were put to death, while the women and children were preserved to be sold into slavery.

Scattered tribes still exist in different parts of the interior. The dress of the women is merely a narrow strip of blue cloth; and their naked bodies are smeared with arnatto, which gives them the appearance of bleeding from every pore. Some dot their bodies and limbs over with blue spots. They wear round the leg, just below the knee, a tight strap of cotton, and another above each ankle. These are bound on when a girl is young, and hinder the growth of the parts by their compression, while the calf, which is unconfined, appears in consequence unnaturally large. Through the lower lip, which they perforate, they wear two or three pins with the points outwards. Should they wish to use one of them, they take it out, and afterwards replace it. The men secure a cloth round the loins, often of sufficient length to form a kind of scarf; and to prevent it trailing on the ground, throw it in a graceful way over the shoulder, so that part of it

falls on the bosom, while the end hangs down the back. It is often ornamented with cotton tassels, and is the most decent and serviceable, as well as the most picturesque, covering worn by any of the native tribes. Sometimes a coronal of flowers surrounds the head, which is usually adorned by a large daub of arnatto on the hair above the brow; while the forehead and cheeks are painted in various patterns with the same vermilion colour, which adds extreme ferocity to their appearance. Some of the men also smear their bodies with arnatto, as do the women. They are generally well-proportioned, and more elegant in figure than the other races. The women are noted for weaving excellent and durable hammocks of cotton—a plant which they cultivate for that purpose.

When a chief died, his bones, after burial for some time, were cleansed by the women, and carefully preserved in their houses. Several other tribes follow a similar custom; allowing, however, the bones to be deprived of flesh by the ravenous little caribes. After being carefully dried, and tinged with red, they are placed in baskets and suspended from the roofs of their houses. Among those who have embraced Christianity, these and many other barbarous customs have been abandoned.

The object of many of their raids of later years was to obtain captives to sell to the Dutch. When slavery was abolished by the British, this incentive to cruelty no longer existed. The fierce Caribs were, however, very indignant at the new order of things. A Carib chief arriving with a slave, offered him for sale to the English governor. On the refusal of the latter to make the purchase, the savage dashed out the brains of the slave, declaring that for the future his nation would never give quarter—one of many instances of their fearful ferocity. The Carib club is made of the heaviest wood to be found. It is about eighteen inches long, flat, and square at both ends, but heavier at one than the other. It is thinner in the middle, and wound round with cotton thread, with a loop to secure it to the wrist. One blow from this formidable weapon—which is called “patu”—is sufficient to scatter the brains of the person struck. Sometimes a sharp stone is fixed in one end to increase its weight.

The Arawaks.

Differing greatly from the Caribs, the Arawaks, who live in the neighbourhood of the British settlements, have ever been noted for their mild and peaceable disposition. But still they have been compelled to fight for their independence, and use bows and

arrows and clubs—the latter formidable weapon being similar to that of the Caribs. More family affection than other tribes usually exhibit exists among them. Husbands and wives appear faithful and attached, and live happily together. The boys are early trained to fish and paddle their canoes; while the girls assist their mothers, who generally have to do more work than the men. The power of their chiefs, who were formerly called caciques, has almost entirely ceased; indeed, their ancient manners and customs have been greatly changed by their intercourse with the whites. Those living still further in the country, however, practise many of their barbarous customs.

Mr Brett describes a scene he witnessed on the Lake Wakapoa—a dance given in honour of a deceased female, who had been buried in the house where it took place. A broad plank lay on her grave, and on it were placed two bundles, containing the refuse of the silk-grass, of which whips—employed as will be described—were made. There were also two rudely-carved birds in wood, the other figures intended to represent infants. Two large tubs of paiwari—an intoxicating liquor—had also been prepared.

The young men and boys, fantastically adorned, were arranged in two parallel rows facing each other; each holding in his right hand a whip, called the maquarri, more than three feet long, and capable of giving a severe cut—as their bleeding legs soon amply testified. The dance in which they were engaged takes its name from this whip. They waved them in their hands as they danced, uttering alternate cries, resembling the note of a bird often heard in the forests.

At some little distance from the dancers were couples of men lashing each other on the leg. The man whose turn it was to receive the lash stood firmly on one leg, advancing the other; while his adversary, stooping, took deliberate aim, and, springing from the earth to add vigour to his stroke, gave his opponent a severe cut. The latter gave no other sign that he was hurt than a contemptuous smile, though blood must have been drawn by the lash. After a short dance, his opponent returned the compliment with equal force. Nothing could exceed the good-humour with which these proceedings were carried on. One of the men was scarcely able to walk, after the punishment; but, in general, after a few lashes they drank paiwari, and returned to the main body of dancers, from which fresh couples were continually falling out to test each other's mettle.

At length, on a signal from the master of the house, the dancing ceased, and all the men, arranging themselves in procession, went round the building with slow and measured steps, the plank and the wooden images being carried before them.

After this they arranged themselves near the grave, and one of them chanted something in a low voice, to which the others answered at intervals with four moans by way of chorus. The articles carried in procession were then taken to a hole previously dug in the earth, and buried there. Two or three men appointed for the purpose then drew forth their long knives, and rushing in among the dancers, snatched the whips from them, cut off the lash from each, and buried them with the other articles.

The Guaranis.

The tribes of the Guaranis, or Waraus, who once inhabited the eastern side of the continent, from the La Plata to the Orinoco, still exist, sunk still lower in barbarism even than formerly. So little do they care for clothing, that even the females wear only a small piece of the bark of a tree, or the net-like covering of the young leaf of the cocoa-nut or cabbage-palm; while their appearance is squalid in the extreme. They still, however, exhibit the characteristics which distinguished them in days of yore,—readiness to yield to circumstances, to labour for wages, and to receive instruction from the white man. Thus they have continued to exist whilst more warlike tribes have been exterminated. They cultivate cassava and other vegetables. From the former they make the intoxicating paiwari—the cause of many savage murders among them. They depend greatly on the pith of the mauritia, or ita, as it serves them for bread; while of other parts of the tree they construct their dwellings.

The younger people possess good features—some of them wearing thin pieces of silver suspended from the cartilage of the nostrils. They are generally short, stoutly built, and capable of great exertion. They are much sought after for labourers. They are also noted for making the best and largest canoes in the country, and with the rudest implements. The Spaniards are said to have employed some of their canoes which could carry one hundred men. Those in use even at the present day are capable of carrying fifty people.

Though scattered throughout the country, the proper territory of their nation is on the low swampy country which borders the banks of the Orinoco; but their lands being completely

inundated by the overflowing of the rivers for some months in each year, they construct their dwellings above the water, among the mauritia palms, whose crowns of fan-like leaves wave above their heads and shield them from the rays of the burning sun. Not only does this palm afford them shelter and the materials for constructing their habitations, but it gives them an abundance of food for the support of life. To the upright trunks of the trees, which they use as posts, they fix the lower beams of their habitations, a few feet above the highest level of the water. On this framework they lay the split trunks of smaller palms for flooring. Above it a roof is formed, thatched with the leaves of the same tree,—from which they also procure their chief means of subsistence. From the upper beams the hammocks are suspended; while on the flooring a hearth of clay is formed, on which fires are lit for cooking their food. Then their canoes, or woibakas, as they are called, enable them to procure food from the water, and give them the means of moving from place to place.

No tree is more useful to the natives than the mauritia. Before unfolding its leaves its blossoms contain a sago-like meal, which is dried in thin, bread-like slices. The sap is converted into palm-wine. The narrow scaled fruit, which resembles reddish pine-cones, yields different articles of food—according to the period at which it is gathered—whether the saccharine properties are fully matured, or whether it is still in a farinaceous condition.

The Guaranis have of late years come under the influence of Christian Protestant missions.

The Macusis.

In the neighbourhood of the Lake Parima, the Macusis, as well as other tribes, have their homes. The former are noted for being the manufacturers of the celebrated wourali poison described by Waterton. Numerous other tribes, or sections of tribes with different names, exist in the far interior,—both westward and to the north and south. Those inhabiting the Lower Amazon possess some degree of civilisation, and are known under the general name of Tapuyos—from a once powerful nation of that name, existing towards the southern part of the Brazilian coast, and driven northward by still fiercer hordes.

Though less cruel, and frequently sparing the lives of their captives, they had the strange custom of eating a portion of

their dead relatives, as the last mark of affection. Many of the Brazilian tribes were reclaimed from their more barbarous practices by the Portuguese missionaries, who from their numerous dialects formed the language now generally in use—the Tupi, Guarani, or *lingua Geral*. The remoter tribes, however, seeing the way the milder races have been oppressed by unscrupulous traders, and hunted down by government officials to be taken as soldiers, resolutely defend their territories from all strangers, and retain the ferocity and cannibalism of their forefathers.

The Acawoios.

It is pleasing to read of a tribe described by McClintock as superior in domestic virtues to most of their countrymen. The Acawoios, or Kaphons, though warlike, differ from other tribes in many points. Polygamy is not permitted before a suitable age. The women are virtuous, and attentive both in sickness and old age. After a birth, the mother is relieved even from the labour of preparing food for her husband, that she may attend to her child. They are cleanly, hospitable, and generous, and passionately fond of their children. They seldom talk above a whisper among themselves, and however intoxicated—which they sometimes become—never quarrel; nay, more, an angry look is never discernible. They use tobacco; not chewing it, however, but simply keeping it between the lips, for the purpose of appeasing hunger and preserving their teeth. They live towards the head-waters of the Essequibo. On the whole, a more orderly and peaceably-disposed people can scarcely be found anywhere.

The customs of the fierce tribes, though differing in some respects, agree in many others. They are in general indolent, and find clothing unnecessary; they have little to provide beyond their daily food, and thus spend much of their time in their hammocks, leaving the women to labour in the plantations and attend to their domestic concerns. They are, perhaps, more apathetic in manner than reality, having great control over their feelings. Like the whole race, their senses are extremely acute, and kept in constant exercise by following game or tracking an enemy through the forest. They are keen observers of natural objects, and have a considerable knowledge of medicinal and poisonous plants, as well as of the habits of the animals, birds, reptiles, and insects which inhabit their country. They observe the virtue of hospitality, and are fond of paying visits to their friends at a distance—expecting to be treated in the same way. Theft is unusual among them; and so great is their love of

liberty that they can seldom be induced to follow the customs of civilised life.

Drunkenness drives them often to fearful excesses—most of their quarrels springing from that cause. Their dances, though in a certain degree graceful, consist chiefly in stamping on the ground, balancing on one foot, and staggering in different attitudes as if intoxicated—the music being generally monotonous and dismal. Mr Brett describes a curious trial of strength which the Guaranis exercise at their drinking bouts. Each of the antagonists is furnished with a shield made of strips of the mauritia, cut into equal lengths, and firmly lashed across a frame three or four feet in height, but somewhat less in width, and slightly bending downwards. The front of each shield is painted in various colours with some peculiar device, while fastened to the upper edge are elastic stems adorned with coloured tassels and streamers. Each champion grasps the edges of his shield firmly with both hands, and, after various feints and grimaces to throw his opponent off his guard, a clash is heard as one springs forward and his shield strikes that of his antagonist. The contest is generally one of mere strength, the shield being pushed forward by the whole force of the body and supported by one knee, while the other leg is extended firmly behind. Sometimes one of the players is able to push the other off the ground, or, by a dexterous slip and thrust on the flank, sends him rolling on the sand; but more frequently they remain pressing, panting, and struggling until exhausted, when the contest ceases by mutual consent. It is then a point of etiquette to shake the shields at each other in a jeering manner—with a tremulous motion of their elastic ornaments—and to utter a defiant sound like the whinnying of a young horse. This is generally followed by a hearty, good-natured laugh, in which the bystanders join. Another couple then step forward and engage.

Polygamy exists among most of the tribes, and is the great bane of Indian domestic life. Among the Caribs, especially, the woman is always in bondage to her male relations. To her father, brother, or husband she is a slave, and seldom has any power in the disposal of herself. Among the Macusis, the custom of selling even their near relations prevails. When a man dies, his wife and children are at the disposal of his eldest surviving brother, who may sell or kill them at pleasure.

Among their worst features is their proneness to blood revenge, by which, as among other savages, a succession of retaliatory murders is long kept up. They believe also, when a person dies,

that his death is caused by the agency of an evil spirit secured by some enemy; and, having settled who that person is, will follow his steps till they find an opportunity of assassinating him. They are acquainted with several poisonous plants, to which they sometimes resort to destroy those whom they consider their enemies.

Although the savage Indian has some idea of the power of God, which he deduces from the phenomena of nature—such as thunder and lightning—and believes in his goodness in supplying him with cassava and other provisions, yet his whole worship is devoted to propitiate the malignant spirits, to avert evil which might otherwise overtake him; while he has great faith in the power of the native sorcerers, who practise on his credulity. The Guaranis are the most renowned as sorcerers. The huts which are set apart for the performance of their superstitious rites are regarded with great veneration. They believe in various spirits—some of the forests and others of the water—as also in the power of charms and potions; while they have numerous legends by which they account for the creation of the world, the deluge, and many natural objects—some of them apparently derived from the Peruvians and Mexicans, and other more civilised races.

The languages spoken by different tribes are very dissimilar, many common objects being called by names which have no approach to each other in sound. This, however, rather proves the length of time they have existed in the country, their isolation from each other, and the admixture which has from time to time taken place, than that they sprang originally from different stocks. The Guaraní appears to be the simplest and most easily acquired of any of the languages, and is still spoken as far south as the La Plata, as well as on the banks of the Orinoco. The Arawak language is remarkable for its softness. The Carib tongue, somewhat more guttural than the former, is spoken in a smart, vivacious manner. "Those who speak it in its purity, regard as corrupt the language of those Caribs who elsewhere have intermarried with other races," observes Mr Brett. It may easily be understood how an unwritten tongue can, in the course of ages, be thus totally changed, so as to bear no resemblance to the original language. Although in some there is a wide distinction, there are others in which all the Indian dialects seem to agree. In their method of numeration, especially, the first four numbers are represented by simple words. Although the Indian children learn to read and write with facility, they acquire with difficulty the simplest rudiments of arithmetic. This arises from their general method of

numeration—five is represented by one hand; two hands, ten; then they use the toes, and call twenty by the name of “loko,” or man. They then proceed by men or scores. Thus forty-five is laboriously expressed by a word signifying two men and one hand upon it. Some of the Indian words are of great length. Among the Arawaks, such words as *lokoborokwatoasia* (his thought, or remembrance), *rabuintimen-rutibanano* (eighteen), are continually used. “Notwithstanding these,” says Monsieur du Ponceau, “the Indian languages are rich in words and grammatical forms, and in their complicated construction the greatest order, method, and regularity prevail.”

Mounds full of Human Remains.

Undoubted proof has been discovered of the cannibal propensities of some large tribe now passed away, in mounds situated on high ground, and in swamps in the neighbourhood of the coast. On opening one of them—upwards of 20 feet in height and 130 in diameter at its base—it was found to be composed of shells mixed with a large number of broken bones, apparently the relics of meals. The shells were chiefly periwinkles; there were also mussels, the large claws of crabs, the bones of vertebrate fishes and land animals, as well as some hard slabs of pottery resembling the baking-pans used by the wilder tribes at the present day. Among them, the labourers were startled by coming upon human bones, in irregular positions and at unequal depths, huddled and jumbled together. The skulls, some of which were of great thickness, were in fragments. The long bones had all been cracked open, and contained sand and dust. Each mass appeared to have been deposited, without ceremony, in a common heap. Scarcely any were found in natural juxtaposition. Having dug up the bones of several adults, the labourers came upon the remains of a little child; one side of its head had been beaten in, and other bones broken open. With these human relics several stone axes or tomahawks, most of them broken, were dug up; and a sharp-edged stone, which might have been used as a knife. The Indians engaged in the work were very uneasy at having meddled with the human remains, or, as they said, “troubled the bones of the old time people.”

Other mounds of similar appearance were opened, and found filled with similar contents. Though some of the long bones had been broken up, in several instances they had not been severed from each other at the large joints, but merely doubled or twisted one upon the other before they were cast aside.

Mr Brett continues: "It was impossible to explain by any supposition of respectful or decent interment the broken condition of these relics, the violence with which they had been treated, or the apparent contumely with which they had been cast into the common receptacle for refuse matter. The great depth at which many of these remains were found, seemed a convincing proof that they had not been deposited after the completion of the shell heap, but during its accumulation. An old Indian with whom I discussed the matter expressed the opinion of his people very plainly: 'That,' said he, 'is the way in which the nations who used to eat men always broke open the bones to get out the marrow; so our fathers have told us.'" The Caribs anxiously stated that they knew nothing whatever about the mound, and that their fathers had never lived in its neighbourhood. Two other mounds were afterwards discovered; one 250 feet in length and 90 feet in width, and about the same height as the former, and similarly situated. Among the remains were the bones of a man who must have been of large stature and of immense strength. His skull, which was very thick and hard, was found to have been broken in twenty-seven pieces, which all fitted exactly; but when built up, a hole still remained in the right side near the crown, where it would seem the fatal blow—by a pointed stone tomahawk—had been given. Some of the mounds appeared to be of later formation, and in them fragments of pottery were found, though in the older ones none were discovered. While searching over these fragments, the first personal ornaments yet found were discovered,—two small plates of silver with holes bored in them, by which they must have been suspended from the ears. One had lost a corner; but they had originally been cut or broken to the same size and form, and were evidently a pair. Between them lay a skull, which had been placed by itself, and was the first found unbroken. The ornaments, from their position, seemed to have been detached from the head when deposited there. A few feet from that relic lay the limbs of a female, of slight and delicate form. They were unbroken, and much slighter than any others found there. Between the plates was the fragment of a piece of cotton cord which had attached one of the plates to the ear.

While everything about the relics from the previous mounds indicated the savage condition of the people who formed them, these little silver trinkets, though rude, proved feelings approaching women in a state of civilisation. They, with the unbroken condition and comparative soundness of the bones found near them, bring us nearer our own times. As the state of the remains differed from those of the others, so probably did the period and circumstances of the poor girl's fate; but there is

a mystery about it which cannot now be explained. After the mound had been opened, the Indian congregation, neatly dressed, went in procession, with their pastor and teacher, from the chapel to the mound, and collecting round and over it, the various tribes joined in singing the glorious hymn—

“Jesus shall reign where’er the sun
Doth his successive journey run!”

while the lamb, the dove, and other Christian emblems on the banners borne by the school children, waved over the yawning cavity which had disclosed such relics of barbarous days, indicated a blessed change in the life of that long neglected race. May it be extended over the whole continent!

Vegetable Productions.

The trees and animals of Guiana afford a more satisfactory subject for contemplation than the degraded inhabitants. Among them, sin has not entered. They remain in all their perfection and beauty, as they first appeared fresh from the hands of the Creator. A large number are so similar to those found in the Valley of the Amazon, that they need no separate description. In the upper waters of its streams the magnificent *Victoria Regia*, so long unknown to the eyes of civilised man, was discovered by Schombergh not forty years ago.

Here, too, grows the spotted coryanthes, of the order of the Orchideae—*Coryanthes maculata*—hanging from the branches of trees, and suspending in the air the singular lips of its flowers, like fairy buckets, as if for the use of the birds and insects that inhabit the surrounding foliage. In the whole vegetable kingdom a more singular genus than this does not exist, nor one whose flowers are less like flowers to the eye of the ordinary observer. The sepals are of the most delicate texture. When young they spread evenly round the centre, but after a few hours they collapse and assume the appearance of a bat’s wing half closed. The lip is furnished near its base with a yellow cup, over which hang two horns constantly distilling water into it, and in such abundance as to fill it several times. This cup communicates by a narrow channel, formed of the inflated margin of the lip, with the upper end of the latter; and this also has a capacious vessel, very much like an old helmet, into which the liquid that the cup cannot contain runs over.

The cockarito-palm—as it is familiarly called here—grows to the height of fifty feet, and produces the most delicate cabbage of

the palm species. It is enclosed in a husk in the very heart of the tree, at its summit. This husk is peeled off in strata until the white cabbage appears in long thin flakes—in taste like the kernel of a nut. The inner part is often used as a salad, while the outer is boiled, and considered superior to the European cabbage. Within such cabbages as are in a state of decay, a maggot is found—the larva of a black beetle (*urculio*), which, growing to the length of four inches, and as thick as a man's thumb, is called "grogro." This creature, disgusting as it is in appearance, when dressed is considered a great delicacy—partaking of the flavour of all the spices of the East.

A curious shrub—if it can be so called—known as the troolies, consists of large leaves twenty feet long and two broad, of a strong texture, and straight fibres growing from a small fibrous root; the leaves rising from the ends of the eight or ten stems which it puts forth. These leaves are employed chiefly for covering the roofs of buildings.

From the silk-cotton-tree, which grows to the height of one hundred feet, and is twelve or fourteen in diameter, the Indians form their largest canoes. The locust-tree grows to the height of seventy feet, and is often nine feet in diameter. The branches, which only begin to spread in the higher part of the tree, are covered with leaves about three inches in length, and of an oval shape and dark green colour. The blossoms, of the papilionaceous or butterfly form, produce a flat pod, shaped like the husk of a broad bean, about four inches long, and of a dark brown colour. When ripe, each pod contains three beans of the same colour, of a farinaceous consistency, and with a pleasant sweetness.

The silk-grass shrub produces a leaf, the inner substance of which consists of a number of small strong white fibres running longitudinally. These the Indians extract by means of a small loop of cord, through which the leaf is drawn with a jerking motion. They are then ready for drying and twisting into cord. They make bow-strings of great elasticity and strength.

Part 4—Chapter III.

Central Brazil.

The centre of Brazil is occupied by a high tableland, crossed by a series of serras, mostly running north and south. The most

eastern,—the Serra de Espinhaco,—rises about one hundred miles from the coast, and the table-land extends from it westward for upwards of six hundred miles. Numerous peaks besides the serras rise amidst it, few of them reaching a greater elevation than one thousand feet above its surface. It is mostly clothed with coarse grass and bushes, and single-standing trees, which in summer shed their leaves, when, the grass being burned up by the sun, the region has a desert and barren appearance. Here and there the plain as well as the hills are covered with sand, and at others with bare rocks.

Still more desert regions exist, which may vie with those of Africa in barrenness. Almost in the very centre of the continent is a sandy desert, called the Campos dos Paricis. Here the surface is formed by long-backed ridges of sandy hills parallel to one another. So loose is the soil, that even the patient mule with a burden on his back can hardly make his way across it.

Between the western end of this table-land and the Andes of Bolivia is a wide plain from one thousand to fifteen hundred feet in height, with here and there a few hills rising above it. It is mostly covered by dense forests; but occasionally there are barren districts, in which only a stunted vegetation appears. This plain is traversed by several tributaries of the great River Madeira, which falls into the Amazon. In this wide-extending table-land, and among the serras amidst it, rise innumerable streams, which flow into the Amazon on the north and the La Plata on the south—many of them, as they plunge into the plain, forming foaming torrents and magnificent cataracts. The vegetation of these highlands offers a great contrast to the dense forest of the great valley and the seaboard.

The cerrados, as they are called, or scrub—consisting chiefly of acacias and leguminosae—reach to the height of ten or twenty feet. Numerous other shrubs and smaller plants, many of which are medicinal, cover the ground, and send forth a delicious perfume into the pure air. The tussock, in thick clumps, is also seen growing in various directions; indeed, altogether, the Campo is far more completely clothed than either the Llanos or Pampas.

Among these mountains are the celebrated diamond-mines of Brazil. Some of the mines are reached by shafts of great depth, sunk into the earth, whence galleries are run along the veins, somewhat in the mode of gold-mines. Gold is also obtained, by washing in the streams. The diamonds are procured in the same manner. The strictest watch is kept over the slaves employed in searching for diamonds, to prevent them from secreting the

precious stones, and for this purpose numerous overseers are required.

The operations are simple. The loose stones at the bottom of the stream are first raked up into baskets, and then carefully washed, under the inspection of the overseers.

In one district it is calculated that, from 1730 to 1830, diamonds worth upwards of three millions sterling were collected; and in that of Abaete, in 1791, a diamond weighing 1382 carats—the largest in the world—was discovered.

Possibly, however, if the labour which is bestowed on mining were employed in cultivating the ground, it would be productive of greater profit to the country.

Part 5—Chapter I.

Southern Regions of South America.

Geography and Native Tribes.

The vast territory south of the Brazils is watered by a wide-extending branch-work of mighty streams, having as their main trunk the Rio de la Plata at their southern end. To the east is the River Uruguay, running almost parallel with the Atlantic coast. Close to its mouth the far more important Parana, rising in the mountains of the Brazils, near the sources of the Tocantins, falls into the La Plata. While the Tocantins flows north till it reaches the Amazon, the Parana takes a more or less southerly course for many hundreds of miles, till it turns due west for nearly two hundred, and then once more runs south and east till it enters the main trunk. At its extreme western point it is joined by the River Paraguay, which, from its source in the diamond district of the Brazils, has an almost southerly course, receiving on its way numerous large tributaries. One of the most important of these is the Vermejo, which, rising in the Andes, near the source of the Amazon, affords a water communication between Bolivia across the whole continent to the Atlantic. These rivers form the boundaries of several states.

Directly south of the Brazils, between Parana on the east and Paraguay on the west, is the republic of Paraguay, lately ruled over by the two savage dictators, Francia and Lopez. It is a

thickly-wooded region, with numerous streams running through it, and a lofty range—the Cordillera de Caáguazu—at the northern end. The inhabitants are mostly a mixed race of Spaniards and Indians. To the west of the Paraguay river is a wide-extended level region, bounded on the north by Bolivia, and interspersed with lakes and marshes known as the Gran Chaco, and inhabited by tribes of still savage Indians.

The southern boundary of Paraguay is the River Parana, where it runs east and west. To the south of it is the state of Corrientes, a woody but level region between the two rivers, Uruguay and Parana. Further south is the state of Entre Rios; while, to the west, are a collection of confederated towns and villages scattered widely over the Pampas, known as part of the Argentine Confederation; to which the two last-mentioned, as well as Buenos Ayres, to the south of the La Plata, belong.

East of the Uruguay, between it and the Atlantic, is the republic of Uruguay. Through the southern portion of the Argentine Republic flow the rivers Colorado, Negro, and Chupat. On the banks of the latter a Welsh colony has been established; while in various parts of the republic numerous other settlements have been formed by Europeans. The level Pampas—inhabited by those bold and daring riders, the Gauchos, and still wilder tribes of Indians—extending to the base of the Andes, from its peculiar and interesting character demands a separate description.

The Pampero.

The pampero, dreaded on shore as well as at sea, blows with tremendous force across this region.

There is not a cloud in the sky. The night may be perfectly calm. Mosquitoes in vast numbers are busy with their sharp stings. Suddenly a rustling in the woods may be heard afar off. The noise increases into a dull roar. Clouds appear above the horizon. Still all is calm. The mosquitoes vanish. The dogs are howling in anticipation of danger. As if by magic, dark masses of clouds cover the heavens like a curtain. They are rent asunder, thunder roars, lightning flashes, and the wind, like an army of wild beasts, rushes on. Down comes the rain in torrents, beating furiously against the hapless traveller exposed to its fury, or on the deck of the ship. Flash succeeds flash; the lightning in forked streaks darting through the air. In an hour, perhaps, the heaviest part of the storm may be over, but still

the wind blows furiously; till at length it ceases, the clouds disappear, and the air becomes delightfully fresh and cool.

The craft on the rivers are, however, often caught in these pamperos, and driven into the bush, or upset, when the swift current carries down the best of swimmers to a watery grave.

Houses, also, are frequently unroofed, orange groves stripped of their golden fruit, and trees uprooted and hurled to the ground.

Natives of La Plata and its Tributaries—The Pampas and Patagonia.

When the Spaniards first arrived in that sea-like river, with shallow shores—the mighty Parana, to which Sebastian Cabot afterwards gave the name of La Plata—they encountered a fierce tribe (the Charranas) inhabiting its shores. The natives endeavoured to repel the invaders by a system of warfare which the latter, though they describe it as of the most treacherous character, were not slow to imitate. Step by step, however, the Spaniards fought their way; though sometimes defeated and compelled to retreat, they again returned, establishing forts and towns on the banks of the river, till they finally obtained a firm footing in the land. They hesitated at no act, however atrocious, to secure their conquests by the destruction of their foes.

On one occasion being warned that a tribe—the Guaycaruses—with whom they had formed a treaty of peace, had laid a plot to cut them off, they formed a counterplot, far surpassing in treachery that of the savages. The Spanish Lieutenant-Governor, pretending that he had been smitten with the charms of the daughter of their principal cacique, offered her his hand in marriage. The proposal was accepted by the delighted Indians, who, with their chiefs and a large number of people, were invited into the town to attend the ceremony. Meantime soldiers were concealed in the houses to which the chiefs were conducted, and orders were given to supply them amply with intoxicating liquors. While they were thus deprived of their senses, soldiers were sent across the river to destroy the remainder of the tribe who had not come to the wedding. At a given signal the native village was attacked, and every inhabitant slaughtered; while the hosts of those in the town killed more than three hundred of their helpless guests.

The invaders were creating a fearful heritage for their descendants by intermarrying with the native women. From

these marriages have sprung the race which now occupies, in vast numbers, a large portion of that magnificent territory, and who, by their low moral condition, their ignorance, and instability of character, have been the chief cause of the melancholy wars which have so long saturated its plains with blood. The Jesuits, by the missions they formed in various parts of the country, introduced a superficial civilisation among some of the tribes; but their system failing, as it ever has done, to raise the moral character of the people, and fit them for independent thought and self-government, has left them as ignorant and superstitious, and scarcely less savage, than before. Thus they have become the facile tools of every leader who, by greater audacity, craft, or determination, has risen to authority among them.

The Guaranis and their Descendants.

The Guaranis were the principal nation dwelling on the eastern portion of South America. They were probably the same race as the Quichuas, who inhabited the western shores, and a large portion of the Andes, under the rule of the Incas. The two languages are still spoken in various parts of the country. The Guaranis were superior in civilisation to numerous other intervening and more isolated tribes, who had sunk by degrees into greater barbarism. Like the Quichuas, they were agriculturalists—cultivating mandioca, maize, calabashes, and potatoes. They fed on honey and wild fruit; and hunted birds, monkeys, and other animals, and caught fish with their bows and arrows. They had also canoes; and had a better established system of government than their neighbours. Yet they were among the first to bow their necks to the yoke of their invaders; while other tribes, who, though less numerous, fiercely opposed the Spaniards, were swept away from the face of the earth.

The descendants of the Guaranis exist—some in a semi-civilised condition, others as barbarous as of yore—in several parts of the continent; but a large portion became amalgamated with the invaders, and their language is still spoken throughout Paraguay and the neighbouring provinces by the mixed race who have descended from them. The Charruas—the first tribe with whom the Spaniards came in contact—were barbarous in the extreme. Their arms were lances and arrows, and they were noted for their expertness in tracking their enemies. They could bear an almost incredible amount of fatigue, and could subsist for several days without food or water. They wore their hair long,—the women allowing theirs to flow down the back, while the young men gathered up their locks in bunches, and

ornamented them with white feathers. They ate every description of food, even to snakes and insects, and were especially fond of the parasites of the human body. They tattooed their faces and limbs; and soon after a boy was born a hole was made in his lower lip, when a piece of wood was introduced like a nail, the head being in his mouth, while another stick was fastened to it outside.

They lived in tree-formed huts, which they entered on all-fours; and wore no clothes, except in cold weather, when they covered the chest with a piece of skin. They never washed, huddling together in their dirty toldas or huts. They subsisted entirely on the produce of the chase; polygamy was general; their children were not taught to obey their parents, while they appear to have been destitute of all family affection. Their beverage, called chicha—a name common throughout South America—was prepared from honey and water. Although, during lifetime, relations exhibited no affection towards each other, at the death of one of them the survivors underwent many cruel funeral ceremonies. They ultimately assisted the Spaniards in the extermination of several of the neighbouring tribes, but were eventually either destroyed, or brought completely under subjection.

The Querandis or Pehuelches.

The Querandis or Pehuelches—the principal tribe of the Pampas Indians—were, from the first, the chief opponents of the Spaniards in Buenos Ayres. They stole their cattle, made captives of their wives and children, and cut off the soldiers and estancieros, or cattle-farmers, on numerous occasions. They were vain, haughty, and daring. Unlike the Charruas, they paid great attention to their dress and appearance, neither painting nor cutting their hair. The men wore their locks turned up and secured at the top of the head; while the women divided theirs in the centre, wearing them on each side in a large clump, fastened by a ribbon, the ends falling down over each ear nearly to the waist. They wore combs, and were in every respect cleanly. The women also wore necklaces, with hanging ornaments. Their costume was a poncho on festive occasions, highly ornamented; while they wore leather boots. Although, when galloping across the Pampas, they went totally naked, they carried their clothes with them—either to put on during cold weather, or to appear in state when meeting Europeans. Their weapons of war were lances and the formidable bolas,—by means of which, used as slings, they could send stones to a great distance,—and combustible materials, with which they set

fire to the Spanish houses. Their huts were composed of upright poles, four or five feet in height, and as many apart, on which skins of large animals—such as the huanacus or ostrich—were fastened, on the side from whence the cold winds blew. These huts formed long streets; but were used only during cold or rainy weather, as in fine weather they slept on the uncovered ground.

No sooner did the horses introduced by the Spaniards, escaping into the wilds, increase and multiply, than the Indians learned to bestride them, and soon exhibited an uncommon aptitude in their management. Armed with their long lances, they would charge the Spanish troops,—each man lying down at his horse's side, though going at full gallop, and jumping up, turning round, or dropping down again, with wonderful rapidity. Though even the Gauchos give their horses some preliminary training, the Pampas Indian catches the animal with the lasso, throws it down, forces a wooden bit, covered with a piece of hide, into its mouth, from which bit there is a leathern cord to bind round its lower lip, and gallops off.

They are divided into many tribes, who, even a few years ago, made frequent incursions into the provinces of Buenos Ayres, Cordova, and others, and carried off large flocks of cattle—and many Argentines, as captives. They were pursued to the River Colorado, however, when part of the stolen cattle was recovered, and several captives liberated. They are under the belief that when death does not occur, in consequence of violence, it is owing to sorcery.

The Payaguas.

Another tribe or nation must be mentioned—the Payaguas, who inhabited the territory of Paraguay, and from whom the district has taken its name. They used canoes, and many of their warlike expeditions were carried on down the river by water. The women had to perform all the hard work, and were never allowed to eat meat. The boys and girls wore no clothes, but the young men painted their bodies in a variety of patterns.

The Tupis, another large tribe, appear either to have extended to the Amazon, or to have been driven there from the south, as their language is now spoken by the tribes on its banks.

The Toromonos were the chief tribe inhabiting the territory of Bolivia to the north of the Gran Chaco. They lived in houses, each man building one for himself. The men wore no clothes,

but ornamented their heads with a crown formed of feathers; whilst the women wore a small cotton garment, only partially covering the person. They painted their faces, and wore rings in their noses and lips. Many of their customs were cruel and barbarous in the extreme, though they appear to have cultivated the ground, and used ploughs and wooden implements of agriculture. They employed bows and arrows in battle, as also for fishing and killing game. They also showed skill in building canoes.

Indians of Bolivia—Native Apothecaries.

Even at the present day, as was the case in the time of the Incas, the people of one of the tribes were distinguished for their medical knowledge, and sent out travelling apothecaries, who collected herbs,—traversing the whole of the continent. Markham describes meeting with a party of them emerging from the forest,—cadaverous, miserable-looking men, almost worn to death by fatigue and hardship. They wore their long hair plaited and secured behind in the form of a queue. They came from the district of Yungas, and are called Yunguenos, or Cherrihuanos. Formerly they went on foot, but they now ride asses, on which they carry the herbs and nuts, reputed efficacious for the cure of sickness; as well as bundles of chinchona, coca leaf, incense, and other articles.

The Bolivian Indians were subdued only in 1843. Each village or tolderia of these tribes is governed by a cacique, generally possessing hereditary rank; though, as in other cases, much depends upon his physical powers and wealth. A number of wild tribes still roam over the country between the western Argentine states and the Andes. There they live free and independent, though barbarous. When they venture into the neighbourhood of large towns, they soon degenerate into thieves and drunkards. Here they come to carry on a trade in furs and panther skins, or to collect meat at the saladeros, which they dry and carry off with them. They make money by selling Indian ornaments, and foraging for the settlers' cattle; or by thieving, which they look upon as an orthodox mode of gaining a livelihood.

Tribes of the Gran Chaco.

Several tribes inhabited the Gran Chaco. The principal one—the least sunk in barbarism—were the Guanas. They lived in towns arranged in some symmetrical order, composed of palm-trees. Each house formed an enclosed square composed of posts and

arches. To these were fixed horizontal beams, the whole covered with mud and straw. There was but one door, and the structure was sufficiently large to contain a dozen families. They had bed-places on square frames, covered over with boards and straw and skins, while their houses were kept scrupulously clean.

They were noted for their hospitality, and subsisted chiefly by agriculture. They cut off the hair in the middle of the forehead; some shaved sometimes the front half of the head, and others half-moons over the ears. Though the marriage ceremony was simple in the extreme, a contract as to various points was invariably entered into. The men greatly exceeded the women in number, in consequence of the unnatural custom prevailing among them of putting to death the female children. Old women acted the part of doctors.

Their dead were buried outside the doors of their houses, and a considerable time was spent in bewailing their loss. Though they fought bravely with bows and arrows, as well as with spears or clubs, they were of a peaceable disposition, and never made war except in self-defence.

The great ambition of a Chaco Indian is to possess a horse, saddle, and gun. Once mounted, he soon becomes a bold rider.

Their mode of crossing a river is curious. As their canoes cannot carry their animals over, they first drive the horse into the river up to his shoulders in the water, then launch the canoe—after tying the animal's head to the top of the gunwale—with the children and luggage on board. As the horse's feet are off the ground, he cannot injure the canoe. When travelling, however, without canoes, they form small rafts, into which they put their children; and lance in hand, and with bow and quiver at their backs, they bestride their steeds and tow them across, a curious spectacle to witness.

The children go perfectly naked; indeed, so do the people generally, except those who come into the settled districts. The women wear their masses of black hair almost covering their heads and shoulders. They dress in a short skirt, with a scarf over the shoulders. "The old women," observed Captain Kennedy, "are terrible to behold, they having all the hard work to do. They even paddle the canoes, while the men and young women sit looking on."

Their villages consist of rows of wretched hovels. They appear to have no superstitious ideas, but they believe in an evil spirit,

against whom they try to guard by charms and incantations. They are under a chief cacique; and after the other chiefs in conclave have determined on war, or rather, on a plundering expedition, and it is concluded, they separate into their original tribes, each taking opposite directions with their share of the plunder, to escape the risk of being captured. A considerable portion of the almost unexplored district—the Gran Chaco—which they inhabit is a dreary waste of lagoons and marshes, traversed by rapid, muddy, and tortuous rivers.

Jesuit Missions.

The missions established by the Jesuits show the impotence of their system for the civilisation of the wild man. The territory where they carried on their chief labours exists on the eastern bank of the Parana, to the north of Uruguay and Corrientes, bordering on the Brazilian territory. After three hundred years of labour, they left these savages utterly incapable of self-government.

"The Indian mind, indeed," observes Captain Page—an American—"laying aside its atrocities, has never emerged from the intellectual development of childhood. These savages showed the imitative faculties of the animal. When taught, they delved and ploughed, planted cotton and sugar-cane, and executed work in carpentry and wove fabrics, and performed other manual operations; yet their reason and intelligence has not advanced, even *pari passu* in any degree with the progress of European civilisation; nor have the natures of their female population become modified with the slightest trait of the humanities and tendernesses which are the brightest attributes of the women of the present century."

"Among the Jesuit missions in the Gran Chaco," observes another writer, "are found no remaining evidence of better knowledge, than that the Indians now prefer horse-flesh to any other kind of meat."

The same writer gives us the derivation of the names of several of the rivers:—Parana, resembling the sea; Paraguay, from the Payaguas, a tribe of Indians who were met with by the discoverers navigating the river; and Uruguay, from a bird—the uru—which is found on the banks of that stream.

Language.

With regard to the two prevailing Indian languages spoken in the southern part of the continent, it is remarkable that the Quichua, the language of the Peruvians, is still used by the natives found on the banks of the River Salado, in the province of Santiago del Estero, though far-distant from the Andes, in the centre of the Argentine territory; while it is not in use in the intermediate provinces. This proves, either the distance to which the Incas extended their conquests, or perhaps the fact that the natives of Santiago are descendants of a Peruvian colony. The Guarani language is still spoken in Entre Rios and Corrientes, while in the Republic of Paraguay it is more generally used than the Spanish; indeed, paragraphs printed in it appear in one of the papers published in that province. The Jesuits compiled a number of grammatical and other works in the Guarani, for the purpose of teaching the novitiates in their establishments at Paraguay.

The Guarani nation occupied the whole sea-coast, from Uruguay northwards through Brazil, Cayenne, and even into Venezuela.

Part 5—Chapter II.

Paraguay.

The Parana.

After entering the Parana, the voyager sails for hundreds of miles up the mighty stream between lofty clay-banks of a red colour; sometimes absolutely perpendicular, and at others consisting of broken masses covered with cacti and mimosa-trees. Here and there may be seen, projecting from the cliffs, huge skeletons of the toxodon, megatherium, mylodon, and other monsters which once in countless numbers inhabited the plains of South America. Now the river expands into lake-like proportions, its surface dotted with numerous low and wooded islands. At intervals, towns, villages, or forts may be seen on the summits of the cliffs, sixty feet above the water. Generally the country on the western side is a level, treeless plain; but as the river is ascended woods appear, which gradually become thicker, presenting, as further progress is made, more and more a tropical character.

As Paraguay is approached, low flat banks appear, which for many a long league are marshy and impassable. It is the district of the Esteros, as these flooded lands are called. Beyond them,

in the wet season, immense shallow lakes are formed; but when they are dried-up in the hot weather, a grey dusty soil, full of cracks, and covered with wiry grass and low shrubs, is left. Nothing can be more dreary than the appearance of the country when the river is high; the water extending far and wide beyond its crumbling banks, with rows of melancholy palms standing as landmarks above the flood. These districts are, however, valuable for grazing purposes; and before the war were covered by vast herds of cattle, now swept away. Above the Tebiquari the country is higher and more diversified. Vast woods, increasing in breadth and density, appear, with ranges of distant hills beyond them.

Natives.

It is remarkable that the Guarani language, among the peasantry, has almost superseded that of their Spanish invaders.

The natives, with their Indian blood, have inherited small hands and feet, and coarse black hair. The women when young, with their long tresses of jetty blackness, are often pretty; and some, probably descended from Biscayans, are noted for their remarkable fairness. Rubias, they are termed, with blue eyes and auburn hair. The men wear dresses similar to that of the Gauchos. That of the women is picturesque: a long cotton chemise cut low at the neck, with a deep border of embroidery; loose lace sleeves; and a skirt of muslin, or silk, fastened round the waist by a broad sash. Very few wear shoes. Their hair is sometimes arranged in two long plaits, or formed in a wreath round the head, or rolled up at the back and fastened by a large comb. They also wear massive gold chains round the neck, large ear-rings, and numerous rings. Their great amusement, next to smoking, is sipping the yerba or native tea.

"Yerba," says Masterman, "is the dried and powdered leaf *Ilex Paraguayensis*,—a tree in size and foliage resembling the orange, with small white, clustered flowers. It belongs to the holly family, but contains a bitter principle similar to, if not identical with, theine, or the alkaloid found in tea and coffee."

It is taken in a somewhat singular way. The *maté*, a gourd stained black, holding three or four ounces of water, is nearly filled with the coarsely-powdered yerba. The bombilla, a silver tube with a bulbous end pierced full of fine holes, is then inserted. The gourd is filled with boiling water, and the infusion is immediately sucked through the tube, scalding hot.

The bombilla is for the purpose of straining the infusion—which is of a greenish-brown—as the powder would otherwise get into the mouth. Like tea, it is slightly stimulating and astringent.

The natives spin the indigenous cotton of the country, and weave it in a curious way, producing the most intricate lace and needlework. The thread they manufacture is remarkably fine and strong. Weavers travel about the country carrying their simple looms on their shoulders, and may be seen under an orange-tree by the roadside, the warp-roller suspended from a bough and balanced beneath by stones, the workman seated on a horse's skull, and producing a fabric as beautiful as it is durable.

They also manufacture woollen ponchos and saddle-cloths, in patterns of black and white, or of a fine blue obtained from the native indigo. They manufacture cigars; and cultivate the sugar-cane in a rude manner, producing from its root a vile beverage called *caña*, most injurious to the health.

Mountain Scenery.

In the Cordillera, where Masterman describes the scenery as most beautiful, the cacti grow, bristling with spines, and loaded with delicate white flowers; as also the wild pineapple, which covers the ground,—its serrated leaves, of a bright scarlet in the centre, and barred, all straggling from the root. Its fibre is used by the natives for making fishing-nets and lines, and a coarse strong cloth. Paper also has been manufactured from it; and as it can be produced in great quantities, it may become of much commercial importance.

Game abounds throughout the territory. Herds of deer roam in the open glades; droves of pigs are found in the forest somewhat similar to those of England; and a bird, the *yñambù guazù*, as large as a pheasant; while quails are seen in flocks in the esteros,—with snipe, wild pigeons, and other birds.

High up the River Parana is found the magnificent waterfall, El Salto de Guira, rivalling in splendour Niagara itself. Other fine waterfalls are found on different rivers.

Here, too, the ant-eater reaches an enormous size. The capybara is also found. It is obliged to triturate its food—grass, and herbaceous plants—for a long time, in consequence of the contracted size of the oesophagus, which will hardly admit a goose-quill, although the animal is sometimes so large that it

weighs more than two hundred pounds. Its destiny seems to be to feed jaguars, for they live principally on the creatures.

The chinchilla, another rodent, is very common in the fields and esteros. There is a large heron, called in Guarani the *tuyùajù*—that is, one which walks in the mud—nearly as tall as a man, with a bill more than a foot in length. The puma ranges throughout the country, as he does much further south; while the jaguar also appears amid the forests and plains.

Gregarious Spiders.

Among the insects, Masterman describes a gregarious spider which, when full-grown, has a black body half an inch in length—with a row of bright red spots on the side of the abdomen—four eyes, remarkably strong mandibles, and stout hairless legs an inch in length. They construct in concert huge webs, generally between two trees, ten or twelve feet from the ground. In a garden, among trees forty feet apart, these spiders had extended two long cables, as thick as pack-thread, to form the margin of each web, the lower being only four feet from the ground; and between them was a light, loose network perfectly divided into webs, each presenting about two square feet of surface. Each of these sub-webs was occupied by a spider from sunset to a little before sunrise. Six nets contained two thousand of the creatures. They often change their location; and a double stream was always passing along the cables, apparently strengthening them as they came and went.

Sometimes three or four would be lying in wait within a few inches of each other, the one crawling over or under the other's body without hesitation. Soon after sunrise they left their webs, and, retreating to the shade, formed two or three large masses as big as a hat under the thick foliage of a jessamine-tree. There they remained motionless till sunset, when the black lump crumbled to pieces. The process was a curious sight to witness. Then, in a leisurely way, the spiders scattered themselves to their aerial fishing. The air swarmed with mosquitoes, which were caught in great numbers. Larger flies, and especially moths, were at once pounced upon and devoured; a dozen often feeding amicably on the body of the same insect, consuming not only the juices, but the abdomen. When a part of the web was broken, the nearest spider gathered up the loose threads, rolled them into a ball, and ate it. The great difficulty seemed to be how they could convey the first thread, often sixty or seventy feet long, from one tree to the other. This was done by a spider from a tree to windward

forming a long line, which blew out and caught in the leaves of a neighbouring tree to leeward. This it tightened, and then crossed hastily backwards and forwards on the line, adding to its thickness on each journey, till it was strong enough to support a web. The spiders thus employed were apparently all young, for as they increased in age the ferocity of the race appeared. There was then a sanguinary battle,—the few survivors, probably females, devouring some of the slain to provide for a future brood, and then dying also.

The Chigo, or Sand-Flea.

Mr Masterman makes some interesting remarks on the chigo, or sand-flea (*Pulex penetrans*). It is very minute, not exceeding one twenty-fifth of an inch in length. It burrows between the cuticle and true skin, and there lays its eggs—producing a swelling containing a bluish white sac, about the tenth of an inch in diameter, filled with them. This sac is the developed abdomen of the flea. It preserves its vitality after the death of the rest of the parent; and when that event takes place, the eggs are mere germs, which would ordinarily perish at the same time.

Its cutting apparatus consists of two scimitar-shaped lancets, placed in a common sheath, with which it slices out a place beneath the skin, large enough to bury it entirely, anchors itself firmly with its hooked proboscis, and in a day or two dies. The abdominal section, however, still lives, absorbing nutritive material through its walls, and growing rapidly at the expense of the serum poured out by the irritated skin into which it is inserted. It increases in thickness as well as in diameter, and the eggs which now fill it grow also,—when mature, each being half as large as a perfect flea. Thus it is seen why the sand-flea cannot deposit its eggs as do the rest of the family. Probably it has no more food than it carries away within itself on quitting the egg, and therefore cannot provide the material for its greater development. Not only men and children, but dogs, suffer greatly from them—the latter almost tearing their feet to pieces in biting them out, and often getting them in their lips and outer nostrils, from which they cannot dislodge them.

Fish in the Parana.

Among the many fine fish in the river is the dorado,—something like a trout in colour, but deeper; in shape, more resembling the snapper. The natives catch it with unbaited hooks. The fisherman selects a point of rock jutting over the stream, and

having secured three polished hooks, back to back, attached to a line, throws it as far from him as possible into the water, giving it several strong jerks to make it look like small fry darting about. The dorado makes a dash at them, and gets hooked—generally through the back.

Part 5—Chapter III.

The Pampas.

Westward of the Parana and the Province of Buenos Ayres stretches out the wide-extended and almost level plain of the Pampas, reaching to the base of the Andes. It is a wild, savage region, sprinkled over here and there with salt-lakes and marshes, in which a few streams, traversing it at considerable distances apart, lose themselves.

The tracks across it are marked by the whitened skeletons of the horses and bullocks which have succumbed to the fatigues of the journey, or the want of water, and have been picked clean by the carranchas, and others of the vulture tribe, or by the active teeth of the voracious little armadillos, which clear away the refuse of the feast left by their feathered companions. Here and there forts or post-houses are found, garrisoned by the wild Gauchos—their appearance in keeping with the scenery.

The huts are generally built of the stalks of huge thistles, and are sometimes mere enclosures, destitute of roofs. They are surrounded by stockades, in many instances formed of thick hedges of cacti, well calculated to resist an attack from the still savage Indians who roam throughout the region in search of plunder.

It is on these plains that the little bizcacha in vast numbers form their burrows; by the side of which, during the day, their small friends the owls of the Pampas take up their posts, and watch the passers-by. Vast herds of horses and cattle now roam in unrestrained freedom across them. Here the tall rhea, the American ostrich, with outstretched wings runs swiftly across the plain. Towards its southern boundaries the huanacu and the deer—*Cervus campestris*—in large herds range at large, while the pools and marshes are inhabited by enormous flocks of wild fowl of all descriptions. Here hundreds of beautiful flamingoes may be seen rising when alarmed, and forming a rosy cloud of

plumage in the blue sky—the tints shading gradually from the delicate pink of their necks to the deep red of their long wings; while many others of the feathered tribes,—some with long legs, others with huge beaks,—fly across the placid pools, their strange cries and varied notes sounding through the air.

The eastern portion of this enormous district in winter presents a peculiarly rich aspect—herds of wild cattle grazing in full liberty on the luxuriant clover which then covers the ground. As spring advances, a totally different plant takes the place of the clover, and in three or four weeks an extraordinary change has occurred. The whole region then appears covered by a dense wood of enormous thistles, which have shot up to a height of nearly twelve feet, and are now in full bloom. So densely do they grow, that they present an impenetrable barrier to man and horse, or even to the strong-limbed cattle or wild beasts of the plain. The only passage through them is by those paths which have been kept open by the constant trampling of feet; while certain tracks, intricate as those of a labyrinth, which exist in some directions, are the abodes of bands of robbers, to whom alone they are known. From their recesses they sally forth to attack the solitary rancho, or to murder the traveller who may be passing through, knowing well that they can secure a safe retreat, without the risk of being pursued.

Beyond this region of thistles is a second wide district, which produces long grass, changing only, according to the season, from green to brown; while beyond it, again, is a third region, reaching to the base of the Cordilleras, and mostly covered with thick groves of low trees and evergreen shrubs, with here and there streams passing amid them.

Descending from the Andes, the first view of the Pampas resembles somewhat the wide-spreading ocean seen from afar; but as the sun rises, irregularities can be distinguished in the northern portion,—while the streams which run through it from the mountainsides glitter like silver threads, till lost in the immensity of the distance.

But to return to the previous region. For several months the tall thistles hold possession of the plain, but at length the heats of summer tell upon them. They lose their sap and verdure, their heads droop, the leaves shrink and fade, the stems become black and dead, though still they stand rattling one against the other with the breeze. Then dark clouds are seen in the west; the fierce pampero bursts forth with irresistible force; they bend before it, and in a few seconds the whole forest is levelled with the ground. Here, under the influence of the heat and moisture,

they rapidly decompose and disappear, fertilising the soil. Once more the clover rushes up, and the plain again smiles with a verdant hue, and welcomes back the cattle, who have been driven to distant pastures.

Gauchos of the Pampas.

See the inhabitant of this region,—the bold Gaucho, whether owner of thousands of heads of cattle, or the humble peon or chasqui, servant or courier,—mounted on his fiery steed. What command he has over it! How admirably he and the animal seem adapted to each other! If a proprietor or chief manager, he will probably be habited in a white shirt, with wide trousers richly embroidered with deep lace; the chiripa—a piece of cloth covering the body and passing round his legs—being tied with a band; a poncho over his shoulders; boots of polished leather, or, it may be, of simple skin; his heels adorned with a pair of enormous spurs, of silver or less valuable metal, with rowels of prodigious circumference; with his rebenque, or horse-whip, in hand, made of cow-hide, and set off by a handle of massive silver. All classes residing on the Pampas, whether in Uruguay or the Far West, are called Gauchos.

Such in early life was General Urquiza, for some time governor of his native province of Entre Rios. The term is, however, applied generally to the lower orders.

Hardy, and sparely built, like the Arabs of the desert the Gaucho lives on horseback. For most nights the ground is his bed and his saddle his pillow, a piece of hide or a poncho his only covering. He will gallop thirty leagues a day without fatigue.

From his infancy he has been taught the use of the lasso and bolas; and in his boyhood learned to catch the fowls, goats, and sheep about his father's rancho, or to capture partridges in a similar way. Yet he is but little fitted for the ordinary hard work of life. In consequence of his over-exertion and irregular life, his long abstinence from food, and neglect of a due proportion of vegetable aliment, his body appears to be dried-up, his vital energies fail, and his term of existence is shortened.

Impatient of rebuke, he will not brook a hasty word, and will conclude a connection with a master at a moment's notice, by demanding to have his account made up. Horse-racing and gambling are his weaknesses. His knife is ready at hand, and though fatal results seldom follow being engaged in a quarrel,

he attempts to inflict a cut on the face of his antagonist, and there to leave his mark. His food he cooks on a stick—the *asadevo*—fixed in the ground before the fire; and eats it without bread or any kind of vegetable, washing it down with copious draughts of yerba.

He will gamble on all occasions, either with cards, dominoes, or coin—a pitch-and-toss style of game. His horse-racing is more for the sake of obtaining the bets staked on the match. He also delights to bet on the strength of his horse. This is tried by fastening a pair of horses tail to tail, but at some distance, so that each end of a short lasso is tied to the saddle or girth of either animal. They are then mounted, and urged by whip and spur in opposite directions, until the stronger draws the weaker over the goal—a line marked on the ground. In spite of his gambling propensities, he is often intrusted with hundreds of doubloons for the purchase of cattle by his master.

His mode of catching partridges is curious. Armed with a loop attached to the end of a thin stick, he will ride on till he sees a covey of birds on the ground; and then commences circling round them,—the birds, curiously enough, not attempting to fly, but trying to run away instead. The horseman keeps on narrowing his circle, till he at last gets near enough to drop the loop over a bird's head, when he whips it up, a captive, though in no way injured—so that birds can thus be caught alive.

Breaking-in Colts.

Witness the operation of breaking-in a wild colt from amidst a herd of a hundred or more. A Gaucho called the dormador makes his appearance, dressed in a thin cotton shirt secured by a scarf round the waist, and a coloured handkerchief bound to his head, while his legs are guarded by a huge pair of boots, armed with enormous spurs. There he stands, with his lasso coiled up and thrown carelessly over his arm. He advances towards the herd, followed by two mounted Gauchos dressed in full costume. As the colts gallop round the corral, into which they have been driven, with wild eyes and waving manes, he selects one of them; and whirling his lasso lightly round, casts it over the animal's head, sinking down at the same time on his left knee, and holding it with both hands. No sooner does the colt feel the lasso than it bounds into the air, and dashes off, the dormador sliding and crouching along the ground, playing him, as a fisherman does a large salmon, till he has separated him from the rest of the herd. He then brings him into the centre of the corral, plunging and rearing, with his tether much

shortened. Another Gaucho throws his lasso on the ground under the colt's fore-feet, and by an upward jerk tightens it round his legs. At the same time the dormador lets his lasso out freely; the horse dashes out till it is brought to the ground by the other lasso, with a shock sufficient, it would seem, to break every bone in his body. There he lies motionless, while his fore and hind-feet are secured.

At length restored to consciousness, after some convulsive plunges he again gets on his feet, and is led by a further relay of Gauchos to a post, where he is saddled and bridled in spite of his struggles. Regaining his strength, he plunges, kicks, and bites in all directions, the Gauchos nimbly getting out of his way. The dormador, watching his opportunity, now leaps into the saddle, and signs to his companions to cast off the leg-lasso. Immediately the colt, finding his legs free, jumps straight off the ground, and then commences to back, plunge, and dash furiously out. The dormador, however, sticks on; and another Gaucho, coming behind, administers a lash with his long cutting whip, which makes the poor animal start off at full speed, with a snort like a scream. A mounted Gaucho rides on either side of him, to keep him straight. Off he goes over the level country for miles, occasionally stopping to back and kick; but each time his efforts grow fainter, till at length he is ridden back, with eyes bloodshot, covered with foam and blood, and perfectly bewildered, when he is unsaddled and tied to the post. "Poor beast!" observes Captain Kennedy, who describes such a scene, "he looks as much broken down as broken in." Few of the Gauchos, however, can overcome a horse after the manner of the one whose feat he witnessed.

Patagonians.

The chief tribe of Patagonians who inhabit the region as far south as the Strait of Magellan, go under the name of Pehuenches—men of tall and muscular stature, with thick black hair, high foreheads, and broad faces, but in no way approaching to what would be called the gigantic. Their features express passive contentment, but are utterly destitute of vivacity and intelligence. Their feet are remarkably small. They have their eyebrows and moustaches plucked so as to contain only a single line of hairs. The women are of low size, and unattractive—using a sort of pigment on their bodies, composed of animal blood and soot.

The sole covering of both sexes is a mantle made of huanacu skins—worn with the hairy side in—which can be thrown off in a

moment. Their habitations are huts of skin, supported on poles sloping to the ground, towards the direction from whence blows the strong wind or snow from Cape Horn. They sleep, however, in fine weather,—like other tribes further to the north,—on the uncovered ground.

Their great delight is smoking—from a pipe made of stone, fashioned into the shape of a small bowl, in which a long tube is fixed. Each man takes a pull at the pipe and sends it round, gulping in a huge quantity of vapour, all the muscles of the body seeming in a fierce convulsion of straining; and while his neighbour is apparently employed in an effort to gulp down the whole apparatus, there issues from the nose and mouth of the first smoker a cloud which quickly renders his face and all around him invisible.

Like other tribes of the Pampas, they have become expert horsemen, and with bolas capture huanacus and ostriches.

Deer of the Pampas.

Besides the huanacus, a deer of considerable size ranges in small herds throughout the Pampas and northern Patagonia, and is very abundant. It possesses an overpoweringly strong and offensive odour at some periods of the year, which is perceptible at a great distance. Should the Gauchos kill an animal when this is the case, they bury the flesh in the earth, by which means the taint is removed, and it becomes eatable. A person can easily approach a herd by crawling along the ground, when the deer, out of curiosity, apparently, approach to reconnoitre him. They, however, have learned to fear their enemy, man, when mounted on a horse and armed with bolas; and as soon as they see a horseman, they invariably take to flight.

Nata Cattle.

Darwin mentions a remarkable breed of cows called the nata or niata. The animal has a very short and broad forehead, with the nasal end turned up, and the upper lip much drawn back. Its lower jaw projects below the upper, and has a corresponding upward curve; hence its teeth are always exposed. Its nostrils are seated high up, and are very open; and the eyes are projecting. When walking, it carries its head low on a short neck; and its hind-legs are rather longer compared with the front ones than is usual.

The breed is supposed to have originated amongst the Indians southward of the La Plata. It is fiercer than common cattle; and the cow easily deserts her first calf if molested or visited too often. Now, it is a singular fact that an almost similar structure to the abnormal one of the niata breed characterises the great extinct ruminant of India—the sivatherium. The breed is very true, and the niata bull and cow invariably produce niata calves. "Can it be that this animal is an aboriginal of the continent, and existed ages before the European breeds were introduced?" asks Mr Darwin.

The Bizcacha.

The careless horseman on the Pampas soon becomes disagreeably acquainted with the existence of a little rodent—the bizcacha—into whose closely-set burrows should his horse step, he will to a certainty find himself pitched over his steed's head. It closely resembles a rabbit, but with larger gnawing teeth and a longer tail. It has only three toes behind, like the agouti. The creatures are seen in great numbers during the evening seated on their haunches in front of their abodes,—from which they seldom wander far,—gravely contemplating the passer-by. When scampering out of danger, their elevated tails and short fore-legs give them the appearance of large rats.

They have a curious habit of dragging every hard object they find to the mouth of their burrows; round which bones of animals, stones, and hard lumps of earth, are found, collected in large irregular heaps. Although, no doubt, some good reason exists for this habit, it is difficult to account for it. A gentleman told Mr Darwin, that having dropped his watch one dark night, he was unable to find it; but returning the following morning, and searching the neighbourhood of every bizcacha burrow along the line of road, he at length discovered it among a heap of rubbish.

The Peruvian Bizcacha and Chinchilla.

Another little rodent, very similar to the bizcacha of the Pampas, lives high up on the mountain, often at an elevation of 12,000 feet. It resembles the rabbit, but its ears are shorter, and its tail is long and rough.

Nearly related to it, and inhabiting the same region, is the chinchilla—a pretty little creature, rather larger than a squirrel, with great brilliant eyes, an erect tail, strong bristles on the upper lip, and rounded, almost naked ears. Its beautifully soft

fur is much valued by ladies in Europe. It covers in certain districts the slopes of the Andes with its burrows, which trip up many an unwary horseman—greatly to its surprise and alarm, as its only object in forming them is to have a quiet home of its own, where it can bring up its young, and enjoy the roots which it collects, and on which it feeds at its leisure.

The Tucutuco (*Ctenomys Braziliensis*).

The tucutuco—another small rodent, with burrowing habits something like those of a mole—gains its name from the short nasal groan which it repeats about four times in quick succession. It is very abundant, and may be heard at all times of the day uttering its strange sounds directly beneath the feet in its burrow. It throws up little hillocks of earth like those of a mole at the mouth of its abode. So completely are tracks of country undermined by these animals, that horses in passing over sink above their fetlocks.

They are gregarious and nocturnal in their habits. Their chief food consists of the roots of plants, to obtain which they make their extensive and superficial burrows. From the formation of their hind-legs, they are unable to jump even the smallest vertical height.

It is a curious circumstance connected with them, that large numbers become blind,—though apparently the animal suffers but little inconvenience in consequence, as it exists almost entirely beneath the surface of the ground.

The Rhea.

Across the wide Pampas, from the plains of La Plata to the south of Patagonia, the large rhea, vying almost in size with the African ostrich, stalks along, generally in pairs, but sometimes in large flocks of thirty or more. It differs from the real ostrich,—having three toes instead of two, is smaller, and of a uniform grey colour, except on the back, which has a brown tint. Like the ostrich, the back and rump are furnished with long feathers, but of a less rich description than the former species.

When running, it moves at great speed, alternately raising, outstretching, and then depressing its wings.

The cock bird emits a singularly deep-toned, hissing note; and he can be distinguished by being larger, darker coloured, and

having a bigger head than the hen. The cry is so deep and loud, that it resembles that of a wild beast.

His hens lay their eggs at random round a hole which he digs for the nest. He then employs himself in rolling them along into it, by inserting his beak between the egg and the ground, as a boy would roll a hockey ball along with a stick. He then sits to hatch them, while the hens feed round at liberty. He lies so close on these occasions, that he is easily ridden over. He is at this time very fierce, and even dangerous, and has been known to attack a man on horseback, trying to kick and leap up at him. Frequently twenty-two eggs, and even more, are found in each nest.

The rhea, when pursued, readily takes to the water; and sometimes even of its own accord, when not frightened, will swim across a river. One has been seen crossing a stream four hundred yards in width.

When swimming, very little of their bodies appear above water, and their necks are extended a little forward,—their progress being slow.

The rhea is hunted by the Gauchos and Indians on horseback. The huntsmen form a semicircle, gradually closing in on the bird, which does not know in which way to escape. It generally runs off against the wind; at the same time, when it first starts, it expands its wings, and, like a vessel, makes sail. As the huntsman gets close to it he throws his lasso over its neck; or if he is using the bolas, he casts them so as to entangle the bird's-legs, and thus bring it to the ground.

The rhea is easily tamed, and is constantly seen about the huts of the Patagonians.

In the southern part of Patagonia another species, much smaller, exists,—the *Avestris petise*, now called *Struthio Darwinii*, in compliment to the naturalist who has described it. He states that not more than fifteen eggs are found in the nest of the petise, deposited by two or more females. This bird does not expand its wings when first starting at full speed, after the manner of the northern kind. It is a smaller and more graceful bird: its white feathers are tipped with black at the extremities, and the black ones in like manner are tipped with white.

A third species, the large-billed rhea (*Rhea macrorhyncha*), has been discovered. These birds in vast numbers inhabit the wide-

extended plains, and afford a welcome addition to the food of their roving inhabitants.

Caracara Polyborus.

The largest caracara—Polyborus Braziliensis—ranges the grassy savannahs of La Plata. Across the desert, between the rivers Negro and Colorado, numbers constantly attend the line of road, to devour the carcasses of the exhausted animals which chance to perish from fatigue and thirst. It also attends the estancias and slaughtering-houses, accompanied by its smaller relative, the chimango. "When an animal dies on the plain the gallinazo commences the feast, and then the two species of polyborus pick the bones clean," says Darwin. These birds, although thus commonly feeding together, are far from being friends. When the caracara is quietly seated on the branch of a tree or on the ground, the chimango often continues for a long time flying backwards and forwards, up and down, in a semicircle, trying each time at the bottom of the curve to strike its larger relative. The caracara takes little notice, except by bobbing its head. The caracaras are crafty, and steal numbers of eggs; they also attempt, together with the chimango, to pick off the scabs from the sore backs of horses and mules. These false eagles rarely kill any living bird or animal; and their vulture-like, necrophagous habits are very evident to any one who has fallen asleep on the desolate plains; for, when he awakes, he will see on each surrounding hillock one of these birds patiently watching him with an evil eye. If a party of men go out hunting with dogs and horses, they will be accompanied during the day by several of these attendants.

The flight of the caracara is heavy and slow, and it is generally an inactive, tame, and cowardly bird. It destroys young lambs, by tearing the umbilical cord; and it pursues the gallinazo till that bird is compelled to vomit up the carrion it may have recently gorged. It is said, also, that several caracaras will unite in chase of large birds, even such as herons.

The chimango is tame and fearless; and when an animal is killed a number soon collect, and patiently wait, standing on the ground on all sides. Darwin describes seeing one pounce on a dog which was lying asleep close to one of a party of sportsmen. They had difficulty in preventing their canine companion from being seized before their eyes.

It will frequently wait, as does the caracara, at the mouth of a rabbit-hole, and seize on the animal when it comes out. It is

also very mischievous and inquisitive. It will pick up almost anything from the ground: a large black glazed hat was carried nearly a mile, as were a pair of heavy bolas. On another occasion a small Kater's compass in a red morocco case was carried off, and never recovered. These birds are, moreover, quarrelsome and very passionate, tearing up the grass with their bills in their rage. They are noisy, too, uttering several harsh cries—one of them like that of the English rook.

Owls of the Pampas (*Athene Cuniculae*).

The traveller across the Pampas will see a number of little owls—generally seated in pairs, during the evening, on the hillocks near the burrows of the bizcacha, occasionally uttering their strange wild hoots to each other. If disturbed, they either run into the holes of their friends, in which they have their abode; or, uttering a shrill, harsh cry, they move with a remarkably undulatory flight to a short distance, and then turning round, steadily gaze at their pursuer.

The Pampas Cuckoo (*Molothrus Niger*).

Among the birds of numerous kinds which abound on the plains, there are several worthy of notice. One is remarkable from its habits.

It deposits its eggs, like the cuckoo, in the nests of other birds. Several of them may be seen standing together on the back of a cow or horse. They also perch on low boughs: and while pluming themselves in the sun, attempt to sing; but their voice is rather like a hiss, resembling that of bubbles of air passing rapidly from a small orifice under water, so as to produce an acute sound.

The Calandria (*Mina Orpheus*).

The best songster on the Pampas is a species of mocking-bird, called by the inhabitants calandria. Its song is powerful—similar to that of the hedge-warbler. It only sings, however, during the spring; at other times its cry is harsh and inharmonious. They frequent the neighbourhood of houses; and will boldly peck at the meat which is hung up on the posts or walls to dry. When any of the other small birds join the feast, the calandria soon chases them away.

Flamingoes.

The flamingo, in large flocks, visits the New World as well as the Old. On the shores of the great rivers, as also on the banks of lagoons and marshes, it may be seen feeding with other water-fowl—its beautiful red and white plumage shining brightly in the sun, and contrasting with the dark green of the river vegetation.

Oven-Birds.

Of the genus *Furnarius* there are several species. The best-known is the oven-bird of La Plata—the casara, or house-maker, of the Spaniards. It builds its nest in an exposed situation, on the top of a vast bare rock or cactus. It is composed of mud and bits of straw, and has strong, thick walls—its shape being precisely that of an oven, or depressed bee-hive. The opening is large and arched, and directly in front. Within the nest there is a partition which reaches nearly to the roof, thus forming a passage or ante-chamber to the true nest.

The Little House-Builder.

There is another species of *Furnarius*, which the Spaniards call the casarita, or little house-builder. This species builds its nest at the bottom of a narrow cylindrical hole, which extends horizontally to nearly six feet under ground. It generally chooses the side of a low bank, but sometimes penetrates the mud walls round the houses, through which it works its way, frequently—very much to its disappointment—coming out unexpectedly on the opposite side.

The Scissor-Beak.

The scissor-beak (*Rhynchops nigra*) frequents the lakes and streams. It is about the size of a tern, with short legs, webbed feet, and extremely long, pointed wings. The beak is flattened laterally, and the lower mandible is an inch and a half longer than the upper. When flying along in small flocks, close to the surface of a lake, the birds keep their bills wide open, the lower mandible half buried in the water. In their flight they frequently twist about with extreme swiftness, managing, with their projecting lower mandible, to plough up small fish, which they retain in the lower half of their scissor-like bills. Each bird thus leaves its wake on the mirror-like surface. On quitting the water their flight is wild, irregular, and rapid. They then utter loud, harsh cries; their tails, as they fly, are much used in steering their irregular course.

During the day they may generally be seen resting in flocks on the grassy plains, at some distance from the water, as they usually take to fishing at night.

Parrots.

A small green parrot, with a grey breast, frequents the banks of the Parana. It builds on the higher branches of the taller trees.

These birds fly in large flocks, and commit great ravages on the corn-fields.

The Boat-Bill Heron.

In the same localities the curious boat-bill heron is found,—its short thick neck and enormous beak giving it a clumsy, ungainly look alongside the elegant flamingo. The beak may be likened to two boats, laid one upon the other, gunwale to gunwale, the upper part of the mandible representing the keel. It feeds on the Crustacea which it picks up on the shore, as well as on fish—on which it pounces, as they swim by, from some branch overhanging the water.

It is about the size of a duck, its legs being shorter, in proportion to its body, than those of waders in general. On the top of its head the male has a full, long plume of black feathers drooping over the back. The neck and breast are of a greyish-white. The back also is grey, with a wash of rusty-red; while there is a patch of a deeper tint of the same colour upon the middle of the under part of the body. The sides are black, and the tail white.

Although many other creatures besides those which have been described are to be found in the vast regions we have rambled over, none of the larger or more curious have been omitted. We have, however, been able to take only a very cursory glance at the human inhabitants or the wonders of the vegetable kingdom; but it is hoped that the reader will have gained a general and correct view of the various aspects which the wilder portions of the Western World present, as well as of the animals with which the Creator, in his infinite wisdom, has thought fit to people them.

Quitting America, we purpose,—in future volumes,—to wander over the Eastern portions of the globe, the islands of the Pacific, Australasia, and the Indian Archipelago, and to visit the Arctic and Antarctic regions,—where numberless objects are to be

found, not less interesting and wonderful than those described in the preceding pages.
